THE IMPACT OF THE SPACE STATION CANCELLATION

HEARING

BEFORE THE

COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

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THE IMPACT OF THE SPACE STATION CANCELLATION

TUESDAY, JUNE 4, 1991

U.S. House of Representatives,
Committee on Science, Space, and Technology,
Washington, D.C.

The committee met, pursuant to notice, at 9:02 a.m. in room 2318, Rayburn House Office Building, Hon. George E. Brown, Jr., [chairman of the committee] presiding.

The Chairman. We'd like to start the hearing as quickly as we can in recognition of the time pressures that we have this morning.

First of all, without objection, permission is granted for coverage of this meeting by television, radio, and still photography—we don't want to make any outlaws here—and by mutual agreement with myself and Mr. Walker, we're going to preempt all of the opening statement time for ourselves and ask the other—well, I'll make a slight exception for the Chairman and ranking member of the Space Subcommittee, but we're going to ask other members to forego opening statements so that we can get quickly to our witnesses this morning.

Two weeks ago, the VA-HUD/Independent Agencies Appropriations Subcommittee voted to terminate the Space Station. Since then, much has been written and said about the consequences of such a proposal. Many weeks before, this Science, Space, and Technology Committee authorized the full funding for the Space Station, and the full House of Representatives confirmed that authorization overwhelmingly. Today the committee meets to examine the question: Can we afford not to build the Space Station Freedom in view of the implications for our overall Manned Space Program and for international cooperation in all areas?

The United States and many of its primary ally nations as partners have now spent over $5 billion on this program. It has been the focus of our planning for the 21st century in space. Thus, a decision to change directions now goes far beyond the normal stop-start phenomenon that has been the unfortunate hallmark of space development projects. It may signify a fundamental shift away from the Manned Space Program and a major turning point in our efforts to cooperate with other nations on big science projects.

It must also be recognized that the Congress and the Nation face a decade of such tough choices as we struggle to reduce the deficit. Thus, a decision to continue the station must also be made with careful consideration of the consequences. We know that next year and the year after will be extraordinarily difficult, and we may not expect any additional outlays, much less the optimum 10 percent growth envisioned by the Augustine Committee report. We must anticipate the period of belt-tightening that appears inevitable and plan accordingly, whether we continue the station or not.

Today we will examine the full implications of a potential termination of the Station Program and, in so doing, provide some reference point for the debate that will take place on the floor this week. We are pleased to have with us today an array of witnesses whose input and views will be critical in this debate, and I would like to thank them for their appearance here today.

Now I would like to recognize our ranking Republican member, Mr. Walker, for any remarks he might have.

[The prepared statement of Mr. Brown follows:]

OPENING STATEMENT
BY
GEORGE E. BROWN, JR.

IMPACT OF THE SPACE STATION CANCELLATION
JUNE 4, 1991

Two weeks ago, the VA-HUD/Independent Agencies Appropriations Subcommittee voted to terminate the Space Station program. Since then much has been written and said about the consequences of such a proposal.

Many weeks before, this Science Space and Technology Committee authorized full funding for the Space Station program and the Full House of Representatives confirmed that authorization overwhelmingly. Today, the Committee meets to examine the question, can we afford not to build the Space

Station Freedom in view of the implications for our overall manned space program and for international cooperation in all areas?

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It must also be recognized that the Congress and the Nation face a decade of such tough choices as we struggle to reduce the deficit. Thus a decision to continue the Station must also be made with careful consideration of the consequences. We know that next year and the year after will be extraordinarily difficult and we may not expect any additional outlays, much less the optimum 10% growth envisioned by the Augustine Committee. We must anticipate the period of "belt tightening" that appears inevitable and plan accordingly--whether we continue the Station or not.

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I would now like to turn to Mr. Walker, Ranking Republican of the Committee for any remarks he might have. In the interests of time I would like to ask the rest of the Members to include any opening remarks in the record or as a part of their five minute question period.

[Finally I would like to recognize and welcome Mr. xxx who will be sitting with the Committee today.]

Mr. **Walker**. Thank you, Mr. Chairman.

I want to begin by commending you for calling this hearing in such a timely fashion. With the full House scheduled to consider the VA-HUD/Independent Agencies Appropriations bill on Thursday, it is imperative that this committee do everything possible to ensure that the case for the Space Station is made forcefully. There is no doubt in my mind that the Appropriations Committee's decision to cancel the Space Station is a serious blow to the Manned Space Program and to the Nation's future in space. It could well lead to the abandonment by the end of this decade of America's manned space efforts, and that would be a tragedy. But the members of this committee are prepared to fight this action by the Appropriations Committee, and this morning's hearing will help us build the record to make our case on the House floor.

Budgeteers are often thought of as having green eyeshade mentalities with little grand vision of the future. I am pleased to say that the current Director of the Office of Management and Budget does not fit that mold. Dick Darman, coming before us this morning, has shown that he is one who can be fiscally sensible without giving up long term goals for short term returns. Admiral Truly has come to us again this morning, as he has often come to this committee, and he has often been here under tough circumstances, but I can't imagine that he's here under much tougher circumstances than today. This may be the greatest challenge yet that the agency faces.

Finally, I'm pleased to join Chairman Brown in welcoming representatives from our partners in the international Space Station Freedom. We understand the implications that cancelling the station will have for our ability to enter into cooperative science projects in the future.

I look forward to hearing the testimony of our witnesses, Mr. Chairman. Thank you.

[The prepared statement of Mr. Walker follows:]

OPENING STATEMENT OF THE HONORABLE ROBERT S. WALKER HEARING ON THE IMPACT OF THE SPACE STATION CANCELLATION

JUNE 4, 1991

Mr. Chairman, I want to commend you for calling this hearing in such a timely fashion. With the full House scheduled to consider the VA/HUD/Independent Agencies Appropriations bill on Thursday, it is imperative that this Committee do everything possible to ensure that the case for Space Station is made forcefully.

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Admiral Truly, you have come before this Committee under tough circumstances before. This may be the agency's greatest challenge yet.

Finally, I am pleased to join Chairman Brown in welcoming representatives from our partners in the International Space Station Freedom. We understand the implications that cancelling the Station will have for our ability to enter into cooperative science projects in the future.

I look forward to hearing the testimony of our witnesses. Thank you Mr. Chairman.

The CHAIRMAN. Thank you very much, Bob.

Let me recognize our Chairman of the Space Subcommittee, Mr. Hall of Texas, for an opening statement.

Mr. HALL. Mr. Chairman, I'll ask unanimous consent to put my opening statement in the record, but just very briefly let me say that this is an absolute must. It's something that the American people expect. It's something that when the American people know the full facts, they are going to demand. The station has been criticized it's not big enough, not capable enough, not soon enough, and so on and so forth, but the fact remains that this is our first step into permanent occupation of space, and it's central to our planning for the 21st century in space, and it is the basic foundation for the Manned Space Program. It's something we cannot afford to lose.

I think over the next several days Congress is going to make some momentous decisions that are going to forever influence the course of our Manned Space Program and that of our international partners, and some people in aviation and the large companies of this country have feared Japan looking skyward after taking over the automotive thrust. They better fear Japan and some of our other good partners such as Japan looking skyward and taking over the Space Program.

I think it just does not make sense to take just—and they're not just taking one piece of hardware out of the sky. They're taking the plans of Congress over many years, the dreams of many people, the work of scientists, the dreams of school children who are interested in space. It just mustn't happen.

I yield back my time.

[The prepared statement of Mr. Hall follows:]

OPENING STATEMENT

BY

RALPH HALL

Today, the Committee meets to review an issue that has received much public attention over the past two weeks. This level of attention is appropriate since it relates to a decision which may irreversibly change the course of the U.S. space program--the proposed cancellation of the Space Station Freedom.

Mr. Chairman, I want to commend you for calling this hearing today and I look forward to the leadership role that this Committee will play in the debate over the Space Station. We have closely followed the progress of this important program over the past seven years and it is fair to say that we are well versed on both the advantages and the disadvantages of the proposed Station.

Although the Station has often been criticized as not big enough, not capable enough, not soon enough, and so on, the fact remains that it is our first step in the permanent occupation of space. It is central to our planning for the 21st century in space and is the basic foundation of the manned space program.

Like any first, it is plagued with growing pains. It probably has not fulfilled the expectations we laid out seven years ago but it is nevertheless our next and essential step in the manned space program. I also believe that many critics of the Station can be faulted for the same lack of vision that early critics of aviation displayed. It is true that we probably cannot set out in black and white terms the precise cost effective benefits that would convince everyone of its worth. Yet twenty years from now we will look back at the technology development, at the breakthroughs in medical science, at the critical expansion of man's horizon and find the present criticisms laughable.

Over the next several days, the Congress will make a momentous decision that will forever influence the course or our manned space program and that of our international partners. What has been clear to us over the past seven years will need to be made clear to all. I am confident that we will make the right decision in the end.

Mr. Chairman I again want to thank you for calling attention to this issue through todays hearing. I also want to welcome our distinguished witnesses and I look forward to your testimony.

The **Chairman**. Thank you very much, Mr. Hall, for that eloquent statement.

Mr. Sensenbrenner?

Mr. **Sensenbrenner**. Thank you very much, Mr. Chairman.

I think one of the reasons we're here today is because of the goofy way Congress does its budgeting. NASA is put in the same subcommittee budget allocation as housing and veterans affairs and thus competes with housing and veterans affairs for the ever-scarce tax dollars that the Congress appropriates on behalf of the public of the United States of America. There's no rational reason why space should compete with housing and veterans medical care, but that's the way it is, and it's not going to change—at least in the near term future. So it seems to me that we have to lay on the line why a manned space station is necessary for the future of our country, for the young people of our country, as well as for future cooperation between the United States and the international scientific community in the free world.

There is no question in my mind that manned space flight is in jeopardy with the defunding of the Space Station. The Space Station is the primary mission for the Space Shuttle Program from now until the end of the decade, and if we don't build a space station, there will be precious little for the space shuttles that the taxpayers have paid almost $2 billion apiece to do. And I think that that's one of the things that we've got to make very, very plain—that if there is to be a Manned Space Program, it is central that the Space Station be constructed and be constructed on time. This is not a waste of the taxpayers' money. Since the United States Space Program started in 1958, there have been $7 returned to our economy for every dollar of appropriated funds that have been spent on NASA. There are very few Government programs that can brag on that great a return to our investment.

But finally, and perhaps just as important as all of these other points, what is also at stake here is America's credibility with the international scientific community. We have an impressive array of international partners, some of whose representatives will be testifying at this hearing later on today. Those international partners have committed between $8 billion and $10 billion as their share of building the Space Station. They have already spent $1 billion of their money, not the American taxpayers' money, making the plans and doing the designs for what they will be doing on the station. If the U.S. Congress should unilaterally pull the rug out of this international endeavor, the billion dollars that has been spent on behalf of European and Canadian and Japanese taxpayers will go down the drain, and no foreign country will want to cooperate with the United States on other space programs like the EOS Program or other scientific programs like the Superconducting Super Collider, because we will have taught them a very expensive lesson that America is an unreliable partner.

So I think that if we're looking at international contributions for scientific programs—not for the next decade, but for the next century—we had better make the right decision here in continuing to fund Space Station Freedom, because if we don't do that, then advancement of science—the United States is going to have to go it alone, and that's going to result in a lot more cost to the American taxpayer than spending the $1.8 billion or $1.9 billion more that will be proposed in this amendment that will be coming up later on this week.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Sensenbrenner.

As the Chair earlier stated, we'd like to request the other members to hold their opening statements until the questioning period or insert them in the record, if they will. Some of our witnesses have time pressures and will have to leave in the not-too-far-distant future, and we'd like to get to them as quickly as possible.

The Chair would like to point out that there is a caucus of the Democratic members on the floor, and as a consequence we're missing a number of those, and we hope that they will show up a little bit later.

At this point, I'd like to recognize Mr. Richard Darman, Director of the Office of Management and Budget, and again express our thanks to him for being here this morning. We know how busy he is.

Mr. Darman?

STATEMENT OF RICHARD G. DARMAN, DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, D.C.

Mr. DARMAN. Thank you very much.

I have a statement which I've provided to the committee which is rather long, and it includes the submission that I've also given to the Appropriations Committee, and I would request that that be included in its entirety in the record.

The CHAIRMAN. Without objection, it will be included.

Mr. DARMAN. Thank you, Mr. Chairman.

I now have a relatively brief oral statement which I would ask your permission to proceed with.

The CHAIRMAN. You may proceed.

Mr. DARMAN. Chairman Brown, ranking Republican member Walker, Congressman Hall, Congressman Sensenbrenner, and distinguished members of the Committee on Science, Space, and Technology, I thank you for inviting me to testify on the proposed cancellation of Space Station Freedom, as recently voted by the House Appropriations Committee. I regret deeply, as I know many of you do, that this issue has even arisen, but I appreciate having the opportunity to address it.

The Appropriations Committee vote to cancel Space Station Freedom is, at this stage, a preliminary action in a process that will involve several opportunities to bring broader perspective to bear. Nonetheless, it is, in its way, a pathetic commentary. America is the world's number one politico-economic power, an inspiring beacon of hope, a continually self-renewing pioneer of new frontiers. America did not rise to this remarkable position on the strength of votes for the status quo. America will not preserve its position or fulfill its historic responsibility with short-sighted votes of retreat.

The moving concept, "the American dream," has never been static or closed or merely material. Our culture has defined itself as uniquely open, expansive, courageous, risk-taking, and forward-looking; not intimidated by limits, but challenged by them, not cowered by technology, but determined to use it to advance man's highest aspirations. It was in this spirit that President Kennedy delivered perhaps the most resonant of inaugural addresses, seeking to invoke "the wonders of science instead of its terrors." He inspired future generations, including my own, with the call, "Together let us explore the stars." I might say his inaugural would surely have been less inspirational if he had advanced the wisdom of the Appropriations Committee, "Together let us fund a Miami parking garage and 100 lesser special interest projects."

[Laughter.]

Mr. DARMAN. Space Station Freedom is a direct outgrowth of the spirit of the Kennedy inaugural, the American spirit. I believe that spirit to be irrepressible, so I'm confident that in due course the Congress will live up to America's tradition, responsibility, dreams, and mission and will set us firmly on the path toward manned exploration of the next frontier. For the moment, however, we're obliged to address a misguided detour sign that would steer us away from America's historic pioneering path.

It's difficult to discern any satisfactorily defensive logic in a vote to kill Space Station Freedom at this point. The arguments for cancellation simply do not withstand inspection. Indeed, each of the major arguments represents a curious fallacy. There is, first, the deficit reduction fallacy From a fiscal perspective, the failure to appropriate $2 billion for Space Station Freedom would not save a dime. Under the budget agreement, total discretionary spending is set. What is at issue is the allocation, not the total. Indeed, the Appropriations Committee has already proposed to reallocate and spend every single penny that would otherwise go to the Space Station.

It is true that the failure to fund Space Station Freedom would have the following effects: it would reduce related jobs in at least 24 States; it would break international commitments to Canadian, European, and Japanese partners; and it would renounce the specific funding guidance provided by the legislative process less than a year ago. That guidance called for NASA budget increases of 8 to 10 percent for NASA's budget. The appropriators have now switched to -1 percent. The legislative guidance called for a redesigned Space Station increasing in cost at the rate of 10 percent per year up to a level of $2.5 billion. The Administration has met that test. The House in effect approved it by voting 361 to 36 only a month ago to reauthorize NASA and the Administration's proposed funding level for Space Station Freedom. Yet now all the redesign work and commitments would be thrown to the wind if the action of the House Appropriations Committee were to stand.

I do not deny that this is Congress' prerogative, and I favor making tough choices on the merits, but we should be clear: the case for cancellation has not been made on the merits, and breaking faith on Space Station Freedom should not be confused with deficit reduction.

The second fallacy is the "there's got to be a better way" fallacy. There are several respectable designers and analysts who have offered paper alternatives to Space Station Freedom as would-be better approaches to manned exploration in space. With the benefit of hindsight, one can admit that there may have been better approaches to have pursued if—if—the political system had recognized and adopted them years ago. But it did not. Looking forward, one can confidently predict that there will be better approaches than the current design which may be used in the future. That is the nature of progress.

From a progressive perspective, it's close to trite to note that there may be a better way. There is almost always a better way coming along to replace the way of the moment, but that is not the point. Progress does not come without beginnings, and if the rule were never to proceed if better alternatives might be conceived, there would be no beginnings. A decision now to wait for the better way to space would be a bit like telling the 19th century wagon masters who led Americans west, "Don't go to California now. Wait a century, and your descendants will be able to fly to San Francisco by air."

[Laughter.]

Mr. DARMAN. There's a partially appealing logic to such visionary wisdom, no offense to California.

[Laughter.]

Mr. DARMAN. Presumably, detail people would solve the problem of there being no "there" there when one were ready to fly—no California aerospace industry and no place to land, for that matter. Indeed, maybe the generations of 20th century air travelers could be told, "Postpone the California trip until mankind has invented the hovering spacecraft," unless, of course, someone were to have in mind an even better way.

The practical reality of the moment is this: a failure to fund the redesigned Space Station Freedom will effectively postpone manned exploration by at least a decade. A credible argument can be made it would be substantially more. If one is serious, the time to commit is now.

The third fallacy is the spend-the-savings-on-science fallacy. There is a group of well-meaning scientists and science advocates who favor Freedom's cancellation in order to allocate the savings to purer forms of science. Their position rests on two premises: first, that space exploration is not science. This is partially—not wholly, but partially—correct, although it ignores the extent to which exploration can enable, stimulate, and inspire science. The second premise is that savings from reduced exploration will be allocated in fact to increased science. This is politically naive. It reflects more time spent in academe than in halls of Congress. The reality is that appropriators will tend to do exactly what the station-killing committee has proposed to do: give no more to science than in the President's budget; reduce Space Station to zero; and reallocate every single dollar thus "saved" to non-science—to subsidies for the type of housing programs that have proven to be failures, to a quarter of a billion dollars in unrequested special earmarks, and so forth.

The Bush Administration has been a strong proponent of both science and space, proposing higher levels of science and space investment than any administration in history, and we have achieved record levels of investment working with the Congress, in part because of the strength of the science and space coalition supporting the President's proposals. It is therefore with the deepest of regret that we have observed the recent outbreak of factional cannibalism. It has not only weakened what was a successful coalition, but it has done so on the misguided political assumption that what is taken from space must go to science. Indeed, the unfortunate irony is that given the cannibalism now, the resources available for both space and science may be less than they would have been if there had been no outbreak of cannibalism in the first place.

The fourth fallacy is the poor-return-on-investment fallacy, and I've called this "Type One: Methodological Error." I have a second type, and then I'll close. Some critics of Space Station Freedom criticized it as if it were a single- purpose enterprise. Thus, it can be shown that there may be more cost-effective means to do some types of microgravity research alone or that Freedom's infrastructure investment is excessive for the amount of life sciences research alone that it permits in its early stages. But, of course, Space Station Freedom is intended to serve multiple purposes and to expand incrementally with relatively low-cost, modular additions. The appropriate methodology for evaluating it must give weight to its capacity to serve multiple purposes, to expand over time, and to bridge forward across generations. When evaluated from this perspective, the return promises to be well worth the investment.

The fifth fallacy is the poor-return-on-investment fallacy that I've called "Type Two: Imaginative Error." It is a more fundamental problem with narrow-purpose evaluations of Space Station Freedom. Simply put, they show a remarkable lack of imagination. If Columbus' trip to America had been similarly evaluated, he would have been forbidden to sail on the grounds that the Nina, the Pinta, and the Santa Maria were not the most cost-effective means to research motion sickness. The obvious point is exploration is up to something somewhat larger than narrowly focused evaluations can capture—larger even than the pioneering participants themselves can imagine.

And so it has been with the expansion of all frontiers. In 1803, the Louisiana Purchase was completed for what seemed like the large and fair sum of $15 million. The frontier thus purchased is now 15 States, producing almost $200 billion in Federal taxes each year. By that very crude measure, the original purchase is repaid again and again at the rate of several times each day. In 1867, Alaska was purchased for $7.2 million. The purchase was subject to considerably more criticism than Space Station Freedom. It was ridiculed as "Seward's Folly" out of disrespect for the Secretary of State who negotiated the terms with Russia. Today, Alaska's proven oil reserves alone exceed $125 billion, and no one is rushing forward to propose the return of Alaska.

And so it will be one day with the vast resources of space. Future generations will be delighted to have developed them and may even take them for granted. We cannot now know exactly how all this will transpire. We can point to potential leaps forward in telecommunications, materials processing, energy and mineral resource development, environmental protection, and the expansion of the human frontier for living and work, but we can only trust that, as with every other great frontier, the returns on investment and exploration will exceed the imaginative grasp of the pioneers and will mark still further triumphs of the expansive human spirit.

There are several tests that define whether or not a culture is, in the most basic sense, civilized. Does it create symbols and communicate with them? Does it plan and invest for the future? Does it organize itself to transfer value and values in a way that builds across the generations? From this perspective, the decision whether or not to commit to Freedom may be seen as a defining test of our civilization.

When President Kennedy ignored his science advisors, took the leap of faith, and committed man to walk on the moon, he helped reaffirm America as a pioneering civilization. It's only from that perspective that the famous Neil Armstrong phrase has meaning: "One small step for man, one giant leap for mankind." The moonwalk was not intended or understood as a mere stunt. It was part of a very much larger process intended to build across the generations.

School children now have come into a world in which the walk on the moon has long since taken place. In their lifetimes, the only miraculous moonwalk has been Michael Jackson's backward glide. For them, the next big step in space is Space Station Freedom. That is what some of them do their science projects about. That is what they understand to be America's next intended leap for all mankind on the path toward the next frontier.

So using the moonwalk metaphors, I'd conclude simply by noting the question before the Congress might be put: Does the Congress mean to affirm the next leap forward, or would it rather content itself with a backward glide?

I thank you very much, Mr. Chairman.

[The prepared statement of Mr. Darman follows:]

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

EMBARGOED FOR RELEASE
9:00 AM EST, JUNE 4, 1991

TOWARD THE NEXT FRONTIER: SPACE STATION FREEDOM AND AMERICA'S COMMITMENT TO THE FUTURE

OPENING STATEMENT BY

RICHARD DARMAN
DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

PRESENTED BEFORE
THE HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

JUNE 4, 1991

Chairman Brown, Ranking Republican Member Walker, and distinguished members of the Committee on Science, Space, and Technology:

Thank you for inviting me to testify on the proposed cancellation of Space Station _Freedom_, as recently voted by the House Appropriations Committee. I regret deeply -- as I know many of you do -- that this issue has even arisen. But I appreciate having the opportunity to address it.

The Pioneering Path -- and The Misguided "Detour" Sign

The appropriatons committee vote to cancel _Freedom_ is, at this stage, a preliminary action in a process that will involve several opportunities to bring broader perspective to bear. Nonetheless, it is, in its way, a pathetic commentary. (I have attached a copy of my June 3rd letter to the House Appropriations Committee. It analyzes the sub-committee action with respect to Space Station Freedom and related matters. It advises the committee of a senior adviser's veto recommendation if the Administration's objections to the sub-committee action are not addressed.)

America is the world's number one politico-economic power, an inspiring beacon of hope, a continually self-renewing pioneer of new frontiers. America did not rise to this remarkable position on the strength of votes for the status quo. America will not preserve its position -- or fulfill its historic responsibility -- with short-sighted votes of retreat.

The moving concept, "the American Dream," has never been static or closed or merely material. Our culture has defined itself as uniquely open, expansive, courageous, risk-taking, and forward-looking -- not intimidated by limits, but challenged by them; not cowered by technology, but determined to use it to advance man's highest aspirations.

It was in this spirit that President Kennedy delivered perhaps the most resonant of inaugural addresses, seeking to invoke "the wonders of science instead of its terrors." He inspired future generations with the call, "Together let us explore the stars . . . ." (His inaugural would surely have been less inspirational if he had advanced the wisdom of the appropriatons committee, "Together let us fund a Miami parking garage and a hundred lesser special interest projects.")

Space Station Freedom is a direct outgrowth of the spirit of the Kennedy inaugural -- the American spirit. I believe that spirit to be irrepressible. So I am confident that, in due course, the Congress will live up to America's tradition, responsibility, dreams, and mission -- and will set us firmly on the path toward manned exploration of the next frontier. For the moment, however, we are obliged to address a misguided "Detour" sign that would steer us away from America's historic pioneering path.

The Fallacious Logic of the Kill

It is difficult to discern any satisfactorily defensible logic in a vote to kill Space Station Freedom at this point. The arguments for cancellation simply do not withstand inspection. Indeed, each of the major arguments represents a curious fallacy:

(1) The Deficit-reduction Fallacy. From a fiscal perspective, the failure to appropriate $2 billion for Space Station Freedom would not "save" a dime. Under the budget agreement, total discretionary spending is set. What is at issue is the allocation, not the total. Indeed, the appropriations committee has already proposed to reallocate and spend every single penny that would otherwise go to Freedom.

It is true that the failure to fund Freedom would have the following effects:

- It would reduce related jobs in 24 states.
- It would break international commitments to Canadian, European, and Japanese partners.

- And it would renounce the specific funding guidance provided by the legislative process less than a year ago. That guidance called for NASA budget increases of 8-10 percent. The appropriators have now switched to minus 1 percent. The legislative guidance called for a redesigned space station, increasing in cost at the rate of 10 percent per year, up to a level of $2.5 billion. The administration has met that test. The House, in effect, approved it by voting 361-36 -- only a month ago -- to reauthorize NASA and the Administration's proposed funding level for Space Station Freedom. Yet now, all the redesign work and commitments would be thrown to the wind if the action of the House appropriations committee were to stand.

I do not deny that this is Congress's prerogative. And I favor making tough choices on the merits. But we should be clear: The case for cancellation has not been made on the merits. And breaking faith on Space Station Freedom should not be confused with deficit reduction.

(2) The There's-gotta-be-a-better-way Fallacy. There are several respectable designers and analysts who have offered paper alternatives to Freedom as would-be better approaches to manned exploration of space. With the benefit of hindsight, one can admit that there may have been better approaches to have pursued -- *if* the political system had recognized and adopted them years ago. But it did not. Looking forward, one can confidently predict that there will be better approaches than the current design which may be used in the future. That is the nature of progress. From a progressive perspective, it is close to trite to note that there may be a better way. There is almost always a better way coming along to replace the way of the moment. But that is not the point.

Progress does not come without beginnings. And if the rule were never to proceed if better alternatives might be conceived, there would be no beginnings.

A decision now to wait for the "better way" to space would be a bit like telling the 19th-century wagon masters who led Americans west, "Don't go to California now. Wait a century and your descendants will be able to fly to San Francisco by air!"

There is a partially appealing logic to such visionary wisdom. Presumably detail-people would solve the problem of there being no "there" there when one were ready to fly -- no California aerospace industry, and no place to land, for that matter! Indeed, maybe the generations of 20th century air travellers could be told, "Postpone the California trip until mankind has invented the hovering spacecraft!" -- unless, of course, someone were to have in mind an even better way.

The practical reality of the moment is this: A failure to fund the redesigned Station Freedom will effectively postpone manned exploration by at least a decade. If one is serious, the time to commit is now.

(3) The Spend-the-"savings"-on-science Fallacy. There is a group of well-meaning scientists and science advocates who favor Freedom's cancellation in order to allocate the "savings" to purer forms of science. Their position rests on two premises:

- o First, that space exploration is not "science." This is partially correct -- although it ignores the extent to which exploration can enable, stimulate, and inspire science.

- o Second, that "savings" from reduced exploration will be allocated to increased science. This is politically naive. It reflects more time spent in halls of academe than in halls of Congress. The reality is that appropriators will tend to do exactly what the station-killing committee has proposed to do: give no more to science than in the President's Budget; reduce Station to zero; and reallocate every single dollar thus "saved" to non-science -- to subsidies for the type of housing programs that have proven to be failures, to a quarter of a billion dollars in unrequested special interest earmarks, etc. (If other empirical evidence is needed, the recent House appropriations action on the super-collider provides a good case in point. Advocates of "small science" sought to discredit "big science," and to reallocate the savings to themselves. But when the appropriators cut the President's proposal for the super-collider, every single dollar of the "savings" went to unrequested, un-economic special interest water projects!)

The Bush Administration has been a strong proponent of both science and space, proposing higher levels of science and space investment than any Administration in history. And we have achieved record levels of investment -- in part, because of the strength of the science-and-space coalition supporting the President's proposals. It is, therefore, with the deepest of regret that we have observed the recent outbreak of factional cannibalism. It has not only weakened what was a successful coalition. But it has done so on the misguided political assumption that what is taken from space must go to science. Indeed, the unfortunate irony is that, given the cannibalism, the resources available for both space and science may now be less than they would have been if there had been no outbreak of cannibalism.

(4) The Poor-return-on-investment Fallacy (Type One: Methodological Error). Some critics of Space Station *Freedom* criticize it as if it were a single-purpose enterprise. Thus, it can be shown that there may be more cost-effective means to do some types of microgravity research (alone); or that *Freedom's* infrastructure investment is excessive for the amount of life sciences research (alone) that it permits in its early stages. But, of course, Space Station *Freedom* is intended to serve multiple purposes, and to expand incrementally with relatively low-cost modular additions. The appropriate methodology for evaluating it must give weight to its capacity to serve multiple purposes, to expand over time, and to bridge forward across generations. When evaluated from this perspective, the return promises to be well worth the investment.

(5) The Poor-return-on-investment Fallacy (Type Two: Imaginative Error). There is a more fundamental problem with narrow-purpose evaluations of *Freedom*. Simply put, they show a remarkable lack of imagination. If Columbus's trip to America had been similarly evaluated, he would have been forbidden to sail on the grounds that the *Nina*, the *Pinta* and the *Santa Maria* were not the most cost-effective means to research motion sickness! The obvious point is: Exploration is up to something somewhat larger than narrowly-focused evaluations can capture -- larger even that the pioneering participants themselves can imagine.

So it has been with the expansion of all frontiers:

- In 1803, the Louisiana purchase was completed for what seemed like the large and fair sum of $15 million (137 million, if inflated to today's dollars). The frontier thus purchased is now 15 states, producing almost $200 billion in federal taxes each year. By that crude measure, the original purchase is repaid again and again at the rate of several times each day!

- In 1867, Alaska was purchased for $7.2 million (about 70 million, if inflated to today's dollars). The purchase was subject to considerably more criticism than Space Station Freedom. It was ridiculed as "Seward's Folly" out of disrespect for the Secretary of State who negotiated the terms with Russia. Today, Alaska's proven oil reserves alone exceed $125 billion. And no one is rushing forward to propose the return of Alaska.

And so it will be, one day, with the vast resources of space: Future generations will be delighted to have developed them -- and may even take them for granted.

We cannot now know exactly how all this will transpire. We can point to potential leaps forward in telecommunications, materials processing, energy and mineral resource development, environmental protection, and the expansion of the human frontier for living and work. But we can only trust that, as with every other great frontier, the returns on investment in exploration will exceed the imaginative grasp of the pioneers -- and will mark still further triumphs of the expansive human spirit.

Moonwalks and the Future

There are several tests that define whether or not a culture is, in the most basic sense, "civilized." Does it create symbols and communicate with them? Does it plan and invest for the future? Does it organize itself to transfer value and values in a way that builds across generations? From this perspective, the decision whether or not to commit to Freedom may be seen as a defining test of our civilization.

When President Kennedy ignored his science advisers, took the leap of faith, and committed man to walk on the moon, he helped reaffirm America as a pioneering civilization. It is only from that perspective that the famous Neil Armstrong phrase has meaning: "One small step for man, one giant leap for mankind." The moonwalk was not intended or understood as a mere stunt. It was part of a very much larger process intended to build across the generations.

School children now have come into a world in which the walk on the moon has long since taken place. In their lifetimes, the only miraculous "moonwalk" has been Michael Jackson's backward glide. For them, the next big step in space is Space Station Freedom. That is what some of them do their science projects about. That is what they understand to be America's next intended leap for all mankind -- on the path toward the next frontier.

So, using the moonwalk metaphors, the question before the Congress might be simply put: Does the Congress mean to affirm the next leap forward? Or would it rather content itself with a backward glide?

Attachment: June 3rd letter to House Appropriations Committee -- with associated attachments.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

June 3, 1991

Honorable Jamie L. Whitten
Chairman, Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

The purpose of this letter is to express the Administration's views on the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Bill, as reported by the Subcommittee. The Administration objects in the strongest terms to the termination of the Space Station and the funding of excessive public housing subsidies instead of HOPE. In addition, the Administration is concerned about other provisions of the Subcommittee bill. If these concerns are not addressed in the bill presented to the President, his senior advisers would recommend that the bill be vetoed.

Space Station

The Administration strongly objects to the Subcommittee's proposed termination of Space Station Freedom. It is particularly disturbing that such an action should be proposed immediately following the completion by NASA of a comprehensive restructuring of the program, performed at the specific request of the Subcommittee. The restructuring met all of the criteria imposed by the Subcommittee, including limits on annual budgetary growth.

Space Station Freedom is a critical element in planned future space science and technology programs; it is a major contributor to long-term U.S. economic growth; and it is an important element in international cooperation in science and technology. It is a visible manifestation of the nation's commitment to investment in the future.

IDENTICAL LETTERS SENT TO HONORABLE JOSEPH M. MCDADE,
HONORABLE BOB TRAXLER, AND HONORABLE BILL GREEN

The United States has already invested over $4 billion in the Space Station program. Our international partners have already invested over $1 billion. If a program which has been supported by a bipartisan national consensus for the last seven years is now canceled, it would call into question our ability to execute any large, complex science and technology program. Other nations would rightly question our reliability as a partner in such ventures, which would have serious implications for cooperation on important projects in a number of other fields.

The Subcommittee's action is tantamount to an abandonment of America's manned space program. The Committee is urged in the strongest terms to restore full funding for Space Station Freedom.

I will be testifying on the Administration's opposition to the proposed cancellation of Space Station Freedom before the Committee on Science, Space and Technology tomorrow. A copy of my testimony will be provided to you.

HOPE and Housing Programs

The Administration strongly opposes the Subcommittee's severe reduction in the President's requested funding for new housing programs, authorized in the Cranston-Gonzalez National Affordable Housing Act -- especially HOPE homeownership grants. Instead of supporting these new and innovative housing programs that give tenants a stake in their future, the Subcommittee added $1.4 billion above the President's request for the costly and ineffective housing construction programs that have been tried in the past. The 76 percent reduction in the President's request for HOPE grant funding, from $865 million to $210 million, would deny thousands of low-income families the opportunity to become homeowners. The Administration urges support for an amendment to be offered in Committee that would reallocate $380 million of housing funds for HOPE homeownership grants for public housing tenants.

The Administration objects to the Subcommittee's funding level of $2.4 billion for public housing operating subsidies, a $250 million increase over the President's request. The President's $2.2 billion request will more than adequately cover the operating subsidy needs in FY 1992 for two reasons. First, utility costs are now projected to be substantially less than those assumed in the FY 1992 Budget. Second, HUD estimates that a significant portion of the FY 1991 supplemental appropriation will be available for obligation in FY 1992.

Chief Financial Officers Act

The Administration would oppose an amendment to prevent implementation of Public Law 101-576, the Chief Financial Officers Act. This law addresses long-standing Congressional and Administration concerns about financial management deficiencies in the Federal Government. These are deficiencies that must be corrected.

In passing the Chief Financial Officers Act of 1990 (CFOs Act), the Congress found that "[b]illions of dollars...lost each year through fraud, waste, abuse, and mismanagement...could be significantly decreased by improved management." As a remedy, the CFOs Act (passed by voice vote without dissent): (1) strengthens management capabilities; (2) provides for improved accounting systems, financial management, and internal controls to assure reliable information and deterrence of fraud, waste, and abuse; and (3) provides for reliable financial information -- useful to Congress and the Executive Branch -- in financing, managing, and evaluating Federal programs. Implementation of the CFOs Act is essential to good government.

Scoring

Based on preliminary analysis, OMB's scoring of the bill shows that total budget authority would be $287 million above the 602(b) allocation. This results from two adjustments:

- $273 million of this increase is in discretionary receipts for GNMA's mortgage-backed securities program. The Subcommittee assumes that this program makes a profit for the Government; the President's Budget assumes that the fees charged to the users of the program cover its cost.
- $14 million is for VA incremental costs of Operation Desert Shield/Desert Storm that the Subcommittee declared an emergency. These monies would continue to fund additional staff through FY 1992 for claims processing and transition assistance that was provided in the FY 1991 emergency supplemental. The President's Budget assumes there would be an increase in the number of new veterans as a result of the planned reduction of active military strength. Therefore, additional funding is not needed and would not be designated as an emergency.

The Committee is respectfully urged to address these concerns and to support Space Station Freedom and provide additional funding for HOPE homeownership grants. The Administration's other concerns with the Subcommittee-reported bill are outlined in the enclosure.

With best regards,

Richard Darman

Richard Darman
Director

Enclosure

(House Committee)

ADDITIONAL CONCERNS
VA/HUD AND INDEPENDENT AGENCIES
APPROPRIATIONS BILL, FY 1992

MAJOR PROVISIONS OPPOSED BY THE ADMINISTRATION

A. Funding Levels

Department of Housing and Urban Development (HUD)

HOPE. The House Subcommittee provides $1.1 billion for HOPE, $1 billion less than the President's request of $2.1 billion. The largest share of the decrease is in the HOPE Homeownership Grants program, where only $210 million of the $865 million requested was provided. Moreover, the Subcommittee mark provides no funds at all for the Secretary's highest HOPE priority -- public housing tenant ownership. The 76 percent reduction in HOPE grants funding will deny thousands of low-income families the opportunity to become homeowners. This opportunity, endorsed by the Congress last year in the Cranston-Gonzalez National Affordable Housing Act, should be given a chance to become reality with adequate funding.

HOME. The House Subcommittee provides $500 million for HOME grants, $500 million less than the President's request of $1 billion. HOME grants provide States and localities greater flexibility in meeting the housing needs of their low-income residents. Funding HOME at $1 billion in FY 1992 would serve up to 70,000 families, and most of the assistance would be available within two years. These same funds in public housing new construction would create only about one-fifth as many new units some five years after the commitment of funds.

Subsidized Housing--Public Housing Modernization. The House Subcommittee provides $2.5 billion for public housing modernization, $233 million more than the President's request. The President's request of $2.3 billion represents a 28 percent increase over the average modernization funding level for the years 1988 through 1990. The 1991 level of $2.5 billion has increased the substantial backlog of available but unspent modernization funds to around $5 billion. Funding this program at $2.5 billion in FY 1992 will only exacerbate an already excessive backlog.

Subsidized Housing--Public and Indian Housing New Construction. The Administration objects to providing $732.3 million for Public and Indian housing development. Public housing new construction costs twice as much as rental assistance (rental certificates, housing vouchers) with less choice. The President's Budget funds Indian housing units through a set-aside of $125 million in the new HOME grant program. The HOME set-aside will provide more flexibility to Indian tribes to develop housing programs that they believe are most effective. Tenant-based housing vouchers, which utilize existing private housing, can provide housing at less cost and with more choice to tenants.

Subsidized Housing--Elderly and Handicapped New Construction. The Subcommittee provides nearly $797 million, $542 million more than requested by the Administration. The Subcommittee level does not assume any funding for these units through the less expensive and more flexible options of leasing of existing housing. The Administration proposed to fund approximately 3,000 units through leasing, for a total of 5,000 units.

Subsidized Housing. The Subcommittee has inappropriately assumed that $216 million of HUD's Section 8 voucher and certificate budget authority would be carried over from FY 1991 into FY 1992. This lowers new budget authority required in FY 1992 for the HUD's Annual Contributions for Assisted Housing account. While this does not result in a scorekeeping adjustment, it would mean that the Subcommittee is not funding as large a program level as the one assumed in their bill. The Administration would be required to make reductions to programs within the Annual Contributions account, despite specific funding earmarks included in bill language.

Community Development Block Grants. The House Subcommittee provides $345 million above the President's 1992 Budget request for this program. The President's request should be more than sufficient, given the start up of the new HOME program.

Office of the Inspector General. The House Subcommittee cuts by $1 million the President's request for the HUD Inspector General. This reduction will impede audits and investigations to identify and correct management and administrative deficiencies.

Department of Veterans Affairs (VA)

Medical Care. The bill includes an unnecessary $175 million increase above the President's request for Department of Veterans Affairs (VA) medical care. Most of this increase is attributable to personnel costs, such as physician pay, and unrequested program enhancements, such as increased nursing staff. Any increases in personnel costs in VA medical care could be accommodated within the 7.5 percent increase over the FY 1991 level that was requested by the Administration for FY 1992. The additional funds for program enhancements included in the increases are simply not justified at this time, and the Administration opposes any funding level above the President's request.

Construction. The Administration strongly objects to the addition of $72 million for three unrequested VA construction projects: $16.8 million for design of a $187.8 million clinical addition in Ann Arbor, Michigan, $48.8 million for an ambulatory care facility in El Paso, Texas, and $6.4 million for renovations in Tuscaloosa, Alabama. Funding these low-priority projects circumvents VA's orderly construction planning process. The Ann Arbor project, the second costly replacement project in southern Michigan in two years, would be constructed within 40 miles of the $247 million replacement hospital in Detroit.

Parking Garages. The Administration objects to the addition of $10.7 million for parking garages in Nashville, Tennessee, and Miami, Florida. The Subcommittee's rejection of the budget proposal to reallocate FY 1990 funds from a 1,500-space garage in Detroit, Michigan to partially fund the Nashville parking garage disregards VA's current planning projections, which support a 1,250-space garage in Detroit. Moreover, funding unrequested, low-priority projects such as the Miami parking garage further circumvents VA's orderly construction planning process.

Inspector General. The Subcommittee provides $1.9 million less for VA's Inspector General than proposed in the President's FY 1992 budget. The Inspector General is required by statute to maintain an employment level of at least 417 FTE. In addition, the Inspector General's office has been given the responsibility of overseeing the audit of VA's financial statements as required by the recently enacted Chief Financial Officers Act. The funding decrease jeopardizes the Inspector General's ability to carry out these and other responsibilities.

Environmental Protection Agency (EPA)

Superfund. The Administration objects to the Subcommittee's reduction of $100 million in the Superfund program and to the reallocation of an additional $36 million from critical-site cleanup work to fund low-priority activities. These actions would undermine the Administration's efforts to accelerate cleanup of the nation's worst hazardous waste sites and would unnecessarily extend the risks posed by these sites to public health and the environment.

Construction Grants/Wastewater Treatment Grants. The Administration opposes the $295 million increase for wastewater treatment grants because it exceeds the authorized level of funding. The President's request of $1.8 billion to construct facilities to treat domestic sewage is consistent with the overall level authorized by the Water Quality Act of 1987, and would target $300 million to cities with the largest remaining need. These targeted amounts are vital to the achievement of the Nation's water quality goals.

The Administration objects to the removal of $51 million from the President's request to construct a plant to treat sewage discharges from Tijuana and the addition of $76 million for yet-to-be designed Rouge River project. The Administration is committed to addressing serious pollution problems along the U.S.-Mexican border. Tijuana's sewage is causing adverse public health affects in southern California that must be addressed on a priority basis.

Operating Program. The President's request included a $191 million (8 percent) increase over FY 1991 for EPA's Operating programs (Salaries and expenses, Abatement, control and compliance, Research and development, and Buildings and facilities) to fund Clean Air Act implementation and initiatives such as Great Lakes cleanup. The additional $162 million above the request is not necessary to carry out EPA's statutory mandates and would fund activities that are primarily state and local responsibilities (e.g., implementation of the non-point source program, and asbestos loans and grants). Particularly objectionable are the increases that would fund numerous low-priority and special-interest projects, such as expensive unwanted laboratories, at a time when the Subcommittee is reducing funds for Superfund cleanups. The Administration opposes the funding of special interests at the expense of the health and safety of Americans.

Dock Facilities in Bay City Michigan. The Administration strongly objects to the inclusion of $20 million for dock facilities and other items in Bay City, Michigan. This hardly seems consistent with the mission of a regulatory agency charged with protecting human health and the environment.

National Aeronautics and Space Administration (NASA)

Earth Observation System. The Administration objects to earmarking $25 million from Research and Development and $3.4 million from Construction of Facilities for the Consortium for International Earth Science Information Network for work on the Earth Observing System (EOS) data and information system (EOSDIS). The amount earmarked from Research and development is 30 percent of the total funding available for the EOS data and information system -- the most critical element of the EOS program. Earmarking funding for this Consortium, based in Michigan, will have serious adverse effects on the current EOSDIS schedule and thereby delay achievement of the objectives of the broader U.S. Global Change Research Program.

Landsat. The Subcommittee provides $5 million for Landsat long lead parts. This would initiate a new, unrequested program in NASA at a time when other ongoing programs, including Space Station, have few resources. No funds are required in FY 1992 for additional satellites, consistent with the expected lifetime of Landsat 6. The Administration is committed to maintaining the continuity of Landsat-type data, and is considering options for continuing Landsat-type data after Landsat 6, including how Landsat should be funded. Traditionally, Landsat has been funded by NOAA.

National Science Foundation (NSF)

Academic Research Instrumentation Program. The Administration objects to the deletion of funding proposed for the National Science Foundation's new Academic Research Instrumentation program. The Administration requested $50 million for high cost scientific instruments. There is an enormous need for this high cost equipment in order to make continued progress in research in fields such as surface chemistry, materials synthesis and processing, and molecular biology. Breakthroughs in basic research in all of these fields have the potential to make long-lasting contributions to U.S. economic growth. The need of researchers for access to state-of-the art instrumentation far outstrips the additional funding provided by the Subcommittee for facilities renovation funds or for graduate traineeships.

Research Facilities Modernization. The Administration objects to the $20 million provided by the Subcommittee for a program to modernize academic research facilities. The Federal government is providing over $1 billion per year to universities for facilities through use charges and operations and maintenance expenses included in indirect cost recovery payments. This is the proper way to fund academic research facilities. The Administration understands that universities have not always invested these payments for renovation and modernization of buildings and equipment, and has proposed changes in the rules governing indirect costs to address this situation.

Traineeships. The Administration opposes $25 million included for a new program of graduate traineeships. The traineeship programs apparently are justified by concerns over possible "shortages"; however, serious questions have recently been raised about the validity of these alleged "shortages". The Committee is urged to delete funding for this low-priority program.

Salaries and Expenses. The Administration objects to the deletion of funds for NSF's relocation. NSF requested relocation from the General Services Administration (GSA) because its current location is inadequate both in terms of total space and support for NSF's activities (e.g., computer and electrical capability). GSA conducted a full and open competition and has executed a lease on a new facility for occupancy in 1993. Abrogating this lease will be extremely costly to the taxpayer.

The Points of Light Foundation. The Subcommittee provides no funding for the Points of Light Foundation. The Foundation, a Presidential initiative, makes direct and consequential voluntary service aimed at serious social problems central to the life and work of every American. The Committee is urged to fund this program at the requested level of $7.5 million.

National Institute of Building Sciences. The Administration opposes funding for this Institute. Consistent with the Institute's original authorizing legislation, it should continue to be self-supporting as it was in FY 1991.

B. Language Provisions

Environmental Protection Agency

User Fees. The Administration objects to the Subcommittee's deletion of language included in the President's Budget that would allow user fees deposited in the Environmental Services Fund to be used to finance the programs for which the fees are collected. This language is consistent with -- and needed to fully implement -- the EPA fee provisions in the Omnibus Budget Reconciliation Act of 1990. Further, it would provide an incentive for quick establishment of the fees and ensure that they are used to support the programs for which the fees are charged.

Personnel Earmarking. The Administration opposes inclusion of specific staff levels for various EPA headquarters offices. Congressional micromanagement of this nature eliminates the necessary flexibility to allocate staff resources to the most pressing needs. The Committee should delete this provision.

Leaking Underground Storage Tank Trust Fund (LUST). The Administration objects to report language earmarking $1 million for a demonstration project in Iowa. The existing allocation system for LUST resources has worked well and the Committee should avoid the temptation to make this a pork barrel program.

Environmental Education Awards. The Administration requests the deletion of report language which would transfer from the Council on Environmental Quality (CEQ) to EPA the responsibility for the President's Awards for Excellence in Environmental Education. This transfer contradicts the National Environmental Education Act of 1990, which specifically designates CEQ as the administrator of the program.

Department of Housing and Urban Development

Administrative Provisions. The Administration objects to a number of provisions that forgive repayments and a loan to HUD. These provisions allow the cities of Malden and Newburyport, Massachusetts, Vallejo, California, and New London, Connecticut to retain land disposition proceeds, and allows Calhoun Falls, South Carolina to not repay its public facilities loan. These provisions set an undesirable precedent as other communities could seek similar exceptions to HUD program requirements.

Department of Veterans Affairs

Medical Care. Language earmarking $8.75 billion for personnel services within VA Medical Care infringes upon VA's executive management of the veterans' health care system and precludes the Department from utilizing medical funds in the most effective and efficient manner. This provision should be deleted.

Parking Garage Revolving Fund. The Administration objects to the bill language requiring VA to construct a 1,500-space parking garage in Allen Park, MI. This mandate is not supported by VA's current planning projections, which estimate the need for only 1,250 parking spaces at Allen Park.

Federal Emergency Management Agency (FEMA): National Insurance Development Fund. The bill would forgive Treasury borrowing incurred by the National Insurance Development Fund (Crime Insurance). This budget adjustment would not result in any savings. The Committee should delete this forgiveness of debt.

Consumer Product Safety Commission (CPSC). Private industry currently receives CPSC advice, expertise and safety "certification" free-of-charge. The President's FY 1992 Budget proposes to begin to recover the costs of these services through user fees. The budget proposal follows the directive in the recent CPSC reauthorization (P.L. 101-608) that the CPSC should conduct a one-year study on the feasibility of user fees. In failing to adopt proposed user fee language, the Subcommittee has missed an opportunity to improve the operation and equity of federal services.

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VA, HUD, INDEPENDENT AGENCIES, 1992
DEFENSE AND DISCRETIONARY SPENDING
(in millions of dollars)

Major Programs	1991 Enacted		1992 President's Request		House Subcommittee		House Difference from Enacted		House Difference from Request	
	BA	OL	BA	OL	BA	OL	BA	OL	BA	OL
DISCRETIONARY SPENDING:										
DOMESTIC SPENDING:										
Housing and Urban Development:										
Subsidized housing programs	16,910	14,225	16,016	15,801	16,838	15,821	-72	1,585	822	19
HOPE Grants	---	---	865	---	210	---	210	---	-655	---
General and special risk program account	268	62	244	225	244	225	-24	163	---	---
Shelter plus care	---	---	91	4	87	4	87	4	-3	---
Flexible subsidy fund	---	26	203	102	203	102	203	76	---	---
Payments for the operation of low-income housing	2,175	2,047	2,156	2,190	2,406	2,305	231	258	250	115
Drug elimination grants for low-income housing	150	0	165	76	165	76	15	75	---	---
Community development grants	3,205	3,073	2,920	3,099	3,265	3,113	60	40	345	14
Emergency shelter grants	73	67	71	73	71	73	-2	6	---	---
HOME Block Grant	---	---	1,000	20	500	10	500	10	-500	-10
Management and Administration	459	429	479	474	478	474	20	45	-1	-0
Other HUD	160	1,339	319	1,331	277	1,323	117	-16	-43	-8
Subtotal, HUD	23,400	21,269	24,530	23,394	24,745	23,524	1,345	2,255	215	130
Veterans Affairs:										
Medical Care	12,335	12,123	13,260	13,014	13,462	13,156	1,127	1,033	202	142
Other VA	2,011	1,772	1,893	1,738	2,123	1,887	112	115	230	149
Subtotal, VA	14,346	13,894	15,154	14,752	15,586	15,043	1,239	1,149	432	291
NASA:										
Research & Program Management	2,212	2,223	2,452	2,417	2,427	2,396	215	173	-25	-22
Space Flight, Control & Data Comm	5,124	5,184	5,576	5,454	5,618	5,482	493	298	42	28
Construction of Facilities	498	363	480	445	399	440	-99	77	-82	-5
Research & Development	6,024	5,7[illegible]9	7,199	6,389	5,195	5,336	-829	-382	-2,004	-1,054
Other NASA	11	10	15	14	13	13	2	3	-2	-1
Subtotal, NASA	13,868	13,497	15,721	14,719	13,651	13,665	-217	168	-2,070	-1,065

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VA, HUD, INDEPENDENT AGENCIES, 1992
DEFENSE AND DISCRETIONARY SPENDING
(in millions of dollars)

Major Programs	1991 Enacted		1992 President's Request		House Subcommittee		House Difference from Enacted		House Difference from Request	
	BA	OL	BA	OL	BA	OL	BA	OL	BA	OL
FEMA:										
Disaster Relief	---	822	184	356	184	356	184	-466	---	---
Other FEMA	255	330	229	292	271	334	16	4	42	42
Subtotal, FEMA	255	1,152	414	648	456	690	201	-462	42	42
EPA:										
Construction Grants	2,100	2,353	1,900	2,194	2,195	2,199	95	-154	295	5
Hazardous Substance Response Trust Fund (Superfund)	1,616	1,361	1,750	1,514	1,650	1,493	34	132	-100	-21
Salaries & expenses	975	922	1,090	1,062	1,090	1,062	115	140	---	---
Research & Development	255	253	313	276	334	284	79	31	21	8
Abatement, Control & Compliance	979	865	1,020	893	1,134	939	155	73	114	46
Other EPA	157	131	139	148	164	153	8	23	25	5
Subtotal, EPA	6,081	5,884	6,212	6,087	6,567	6,129	486	245	355	42
National Science Foundation	2,316	2,098	2,722	2,416	2,722	2,396	406	298	-0	-20
Resolution Trust Corporation	11	11	30	30	30	30	20	19	---	---
Other Independent Agencies	172	-43	132	111	121	102	-51	145	-11	-9
TOTAL DOMESTIC SPENDING	60,449	57,762	64,915	62,157	63,877	61,579	3,428	3,817	-1,038	-579
DEFENSE SPENDING:										
FEMA	308	310	310	312	310	312	2	2	---	---
All Other	27	26	27	27	27	27	1	1	---	---
TOTAL DEFENSE SPENDING	335	336	337	339	337	339	3	2	---	---
TOTAL DISCRETIONARY SPENDING	60,784	58,098	65,252	62,496	64,214	61,918	3,430	3,819	-1,038	-579

602(b) Allocations:	BA	OL
Defense Discretionary	338	339
Domestic Discretionary	63,590	61,390

Note: 1992 President's request includes legislative proposals.

The **Chairman**. Thank you very much, Mr. Darman. That's an extremely eloquent statement.

In deference to the fact that you have to leave in about 15 minutes or so, I'm going to proceed in the following way. I will wave my own question period and recognize Mr. Hall and Mr. Mineta on the Democratic side and Mr. Walker and Mr. Sensenbrenner on the Republican side, and then the next members in order in which they arrive will be recognized first when Admiral Truly and Dr. Boright speak. I do this purely in an effort to be fair and to make the best use of your time, and I therefore recognize Mr. Hall for any questions that he might have.

Mr. **Hall**. Thank you, Mr. Chairman.

IMPACT OF SPACE STATION CANCELLATION ON INTERNATIONAL COOPERATION ON COMPETITIVENESS

Mr. Darman, you've very adequately covered the waterfront, and I thank you for your time on behalf of the Chairman and this committee and the Congress.

We've touched on the international impact, the U.S. R&D posture, the near term impact and the long term impact on the loss of such a program as this. Let me talk to you just a moment or so about the economy and ask your advice on that fact.

With the Space Station Program involving over 2,000 businesses in 40 States, with 50,000 or 60,000 workers that would be employed on the Space Station Program—many of those people skilled engineers and scientists who are going to be needed to ensure the United States' competitiveness into this next century and whose ranks have already been lessened and atrophied away by the more aggressive pursuit of, say, the Japanese or the European Community—one thing that comes to mind is the SSC and the accelerators in Europe that had attracted so many of our scientists that I have noticed are now coming back, people that supported Professor Rubia. And the Chairman was just in Texas last week, and we noted that several who were major supporters there are coming back to this country and returning.

What advice do you have to this committee and to this Congress on the effect of the cancellation of this Space Station for the prospects of our international participation and the future of manpower and womanpower in the scientific community here in this country?

Mr. **Darman**. Thank you, Mr. Hall.

First of all, I might note that with respect to one of the cases of international cooperation that's of interest to you and many others, the Superconducting Super Collider, we're very dependent on foreign contributions, and so if the Congress fails to live up to the commitments here, then it's understandable that foreigners would fail to make commitments in other areas that we're interested in.

Again, I might note, just referring to my own opening argument, that people who thought and think in the scientific community that they should knock off big science in order to support small science are, again, operating on a fallacious premise. In the case of the Super Collider, we've had another interesting vote with the Appropriations Committee where they cut the President's request and they gave every single dime— every single dime—that they cut the President's request by not to science, but to uneconomic special interest water projects. There are good water projects. These are not the good water projects. That's what happens.

But let me speak to the larger issue as I may. Yes, there are jobs lost in the short term, and, yes, there are problems in terms of commitments in the international community. But even more fundamentally, from an economic perspective, killing the Space Station is going to have an adverse effect on U.S. competitiveness, in my opinion, in a host of ways. One, the manned development of space—manned development of space—is going to force more rapid technological advance in materials processing, in energy storage and transmission, and a host of areas that are going to come back and do what we need to do domestically to get this economy growing in the way we'd all like for the long term. That is, make breakthroughs that will substantially increase productivity. They come from—the big ones come from aspiring to get beyond what people think is possible. That's what's involved in space development.

There is in addition—and I tried to give a touch of this in my opening statement—there is in addition—and this is an intangible—an inspirational question. If you ask people, "What's the problem with American performance on math and science in high school?"—and we've got an obvious problem in international comparisons—it's our kids starting around the third, fourth, and fifth grade start to steer off in another direction. They, for a variety of reasons and it's complex, don't stick with science.

We had a period when they did, when they were inspired in the decade of the 1960s. We need such inspiration again, and it doesn't come from telling them about a whole lot of line items in the budget. There's got to be some sort of objective correlative they can think of. That's too big a word. Space Station Freedom—they understand that. It is potentially inspiring, and it is, as I say, an intangible, but it's also something of substantial value. It's not the only element here. The others would be more than sufficient, but in the long term I'll bet you that this one would be the most significant.

Mr. HALL. And in closing and using as little time in fairness to you and your time, it's just absolutely unthinkable and almost financial madness to bypass this Space Station, is it not?

Mr. DARMAN. Well, from my perspective, it is.

Mr. HALL. Thank you.

I yield back my time, Mr. Chairman.

The CHAIRMAN. Thank you very much.

Mr. Walker?

CONGRESSIONAL COMMITMENT TO THE SPACE STATION

Mr. WALKER. Thank you, Mr. Chairman.

Mr. Darman, in your testimony, you suggested that there was guidance from the legislature last year with regard to Space Station Freedom. When you were preparing your budget for submission to Capitol Hill, did you regard that guidance as a commitment on the part of Congress to move forward in that area?

Mr. **Darman**. Yes, we did, and I should separate its parts. One was the general guidance as to the rate at which the budget would increase, and in fairness I must note we proposed an even higher level for NASA as a whole—14 percent versus the 10 percent—but we did so trusting that there would be, as always, some back-and-forth with the Congress and that we might then settle on the line of guidance.

The more significant guidance, the one I consider on the edge of being outrageous if it's violated, was the specific instruction to NASA to go redesign the Space Station down—a decision, by the way, I agree with—in size and scale and to fit it within a specified price envelope, growing at the rate of up to 10 percent a year and leveling at $2.5 billion. NASA went ahead and did a tremendous amount of work to redesign the Space Station to meet exactly those specifications. In the appropriations bill, we come back, and suddenly we're told by the exact same people, "Forget it." It is ridiculous.

Mr. **Walker**. Well, that's the point I want to make. That legislative guidance came from a very specific group of people on Capitol Hill. It came from the exact subcommittee that we're dealing with that is now killing Station. Isn't that correct?

Mr. **Darman**. That is absolutely correct.

Mr. **Walker**. And that was a part of their legislative report language last year that, first of all, told NASA to redesign the station and then, secondly, gave them the parameters in which that redesign had to take place. It was not a general redesign mission, it was to redesign to this specific spending stream, and that is what was included in your budget presentation. Is that correct?

Mr. **Darman**. That's exactly correct, and we did it specifically to accommodate the guidance of the appropriators.

Mr. **Walker**. And now that same committee is using the smaller station as being less capable as a reason for killing it.

Mr. **Darman**. Yes, and based on faulty analysis.

The Deficit and the Space Station

Mr. **Walker**. I also wanted to go back to your testimony where you make the point that there are no budget savings involved in the decision to backtrack on Space Station Freedom. Is it your contention that even if we eliminated Station for this year and for the years in the future that we would get no deficit reduction out of such a killing of Station?

Mr. **Darman**. Yes. It's my contention that we would get zero deficit reduction out of killing the Space Station, and over the very long term, we would get a worse U.S. economic position over the long term.

Mr. **Walker**. And also, there was a statement in this morning's USA Today from one of the appropriators who was responsible for the evil deed who suggested that the reason for doing this is because Space Station doesn't measure up when put against other priorities. I think your testimony today is an eloquent example of how Space Station does measure up. But given the fact that it does compete against VA and against HUD—and as my colleague from Wisconsin said earlier, a rather strange set of priorities to put together in one subcommittee, but that is the reality—would you speak to the question of, when weighed against the priorities that are within that subcommittee's jurisdiction, why Space Station is one that ought to be uppermost in the minds of the appropriators?

Mr. **Darman**. Let me agree with you and your colleagues who have suggested that is an absolutely absurd structure in the Appropriations Committee, but it's given, and it's regrettable, but it's given. Essentially, it tests how much you'd like to invest in current consumption versus how much you'd like to invest in the future, and there are many, many, many more voters here today interested in current consumption than there are the 10 voters here today who are the beneficiaries of investment for the future. But a test, it seems to me, of the statesmanship of members of Congress is the extent to which at some point they can say, "Notwithstanding the absence of the future voters, we're going to vote for the future." So that's what's involved here. This is a vote for the future. The beneficiaries are not here yet to vote. It's a test of our sense of responsibility to future generations and to civilization's advance.

Now, that said, and putting a high priority on that, I would not quite agree with the formulation that says it has to be the first priority. What there has to be is a reasonable balance. Veterans claims are legitimate claims. Housing claims are legitimate claims. Environmental claims are legitimate claims. In putting the President's budget together, we tried to balance all of these. I would contend — and I believe I could demonstrate several different ways—that it's possible to fund the Space Station and also meet the legitimate requirements in all of those other areas.

Mr. **Walker**. If I might, one follow-up question on that, if in fact we end up in the House, in trying to readjust those priorities, coming in at slightly less than what the Administration originally asked for for Station as a way of trying to get Station reprioritized in the budget, would you have an objection to a budget presentation on the floor that came in at slightly less than the Administration's number?

Mr. **Darman**. Mr. Walker, let me be completely direct about the tactical situation I think we're in, and I apologize if it's foolish to be public about this. I think we should find the way to win the vote in the House and get a substantial—I would hope complete—commitment to Station. But whatever we get, we will then in the Administration seek to pursue our original course in the Senate and then work out the best possible compromise in Congress.

Mr. **Walker**. Thank you, Mr. Chairman.

The **Chairman**. May we quote you on that, Mr. Darman?

[Laughter.]

The **Chairman**. Mr. Mineta?

Mr. **Mineta**. Thank you very much, Mr. Chairman.

It seems to me that the Appropriations Subcommittee has already set us up, and I think a lot of us know the difference between an upset and a setup. What they have said in effect is that in order to—that they want full funding for Space Station to be restored, and that's what the nature of, I guess, our amendment would have to be. As I understand it, that would be, for fiscal year 1992, $2.028 billion. How would you respond to their contention that any request for funding for Space Station has to be on the basis of full funding?

Mr. **Darman**. I believe we should have full funding for Space Station. I think that is what it means to remain committed to it. I hope I wasn't unclear about that. I'm only saying that we've got to first win in the House, and then we'll do the best we can in the Senate.

Mr. **Mineta**. But suppose we're not able to—it seems to me they're setting up a straw man that's going to make it tough for us to even get to that position. My point is that they're setting up something that is really a false premise to say it has to be fully funded. Let's say we come back and we're able to restore $1.9 billion of the $2.028 billion. Is there some way you could help us in terms of responding to that setup that they're asking of the Rules Committee as to what we might offer in the form of an amendment?

Mr. **Darman**. I agree with you, but I can't—we are frequently in the Executive Branch in the position where the rules are used systematically to prevent us from having a fair shot—

Mr. **Mineta**. And it's being used against us, because we're being told, "All or nothing."

Mr. **Darman**. Now you're the innocent victims.

Mr. **Mineta**. Yes.

Mr. **Darman**. I think you have substantially more influence with the Rules Committee than we do. We have none.

[Laughter.]

Mr. **Mineta**. We have next to none.

[Laughter.]

Mr. **Mineta**. If the present course of action were to continue, what would you estimate is, then, the cost to terminate the Space Station contracts?

Mr. **Darman**. I'd have to defer to Admiral Truly—

Mr. **Mineta**. All right. We'll leave that until later on then.

Mr. **Darman**. I do not consider that a likely ultimate outcome. I don't mean to be difficult about this, but if we're going to be terminating, we are essentially killing the effort at permanent manned presence in space for a generation, and I do not believe the President will accept that. I believe the bill would be vetoed, and I believe we would be back at this same issue again.

THE PRESIDENT'S POSITION ON SPACE STATION

Mr. **Mineta**. That was the very next question I was going to ask you, and that was whether the President would veto the VA-HUD/Independent Agencies Appropriations bill if it did not contain funding for the Space Station Program.

Mr. **Darman**. I cannot speak for the President. I can tell you that his senior advisors would recommend that to him, and to date we have a perfect record with respect to such recommendations.

[Laughter.]

NASA PROGRAMS THAT WOULD LOSE SIGNIFICANCE

Mr. MINETA. If the Space Station Program were cancelled, would there be other programs within NASA that would then no longer be required or would be cut back in scope or eliminated?

Mr. DARMAN. Yes. Again, I'd defer to Admiral Truly, but there's one that I note with interest. For example, there's one in Mississippi of substantial importance in the long term, and curiously enough, though there's no logic for that particular program if Space Station is killed, it's actually increased above the President's budget in the House Appropriations Committee mark. This, I'm sure, is an oversight and a mistake that would be corrected.

[Laughter.]

Mr. MINETA. But it does focus one's attention, does it not?

Mr. DARMAN. Well, it did at least catch my eye, and I gather it caught yours.

The CHAIRMAN. I respectfully urge that we not create any humor at the expense of Mississippi.

[Laughter.]

Mr. MINETA. Especially when we need their help.

Many of the other issues have already been dealt with in terms of the international cooperation and the impact on other programs. Let me yield to my colleague from Kansas, who had a burning question, I believe, since I do have some—well, my time just did expire, and I yield back the balance of my time.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Sensenbrenner?

Mr. SENSENBRENNER. Thank you very much.

Mr. Darman, I don't intend to take the full five minutes, but I would like to ask you what your opinion is of the use of the advanced solid rocket motor which is being made in Mississippi if we do not have a station to use that motor to bring things up to?

Mr. DARMAN. It is exactly the curiosity I was referring to. It is very hard to see exactly what that motor is going to be used for. Perhaps it would be just run in Mississippi. I don't know.

[Laughter.]

Mr. SENSENBRENNER. Thank you very much. I do know you have to go.

The CHAIRMAN. Thank you very much, Mr. Darman. We recognize that you've gone beyond the time that you had available this morning, and we thank you for your contribution, and it has been extremely helpful to us.

Mr. DARMAN. Mr. Chairman, could I just apologize? I wouldn't leave for any other purpose, but I've been asked to join the President, and I apologize, and I apologize to my colleagues for taking time ahead of them, but I thank you very much for your indulgence.

The CHAIRMAN. Thank you, Mr. Darman.

The CHAIRMAN. We will now hear from Admiral Truly and Dr. Boright.

I'd like each of you to present your statements, and then we will take up questioning, as I indicated in my earlier remarks, with the next members who have not already had their opportunity in the order in which they arrived to the committee room.

Admiral Truly?

STATEMENT OF RICHARD H. TRULY, ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D.C.

Mr. Truly. Thank you, Mr. Chairman.

I've been before this committee many times in the past four or five years, but I've never been here at a hearing that was more serious to the future of America's Space Program than today's hearing.

Not only the Space Station, but America's Civil Space Program is under fire in the Congressional budget deliberations today, and ironically it occurs at a very time that NASA has been commended by its various committees that are most familiar with our work for the quality of the restructured Space Station Program that we have presented at the specific direction of the Congress. I believe that funding of this important initiative must be included in the fiscal year 1992 Congressional budget.

The development and assembly of Space Station is our commitment to furthering America's leadership. To turn our back on funding Freedom would eliminate an American permanent presence in space, and it would put our entire Space Program in great jeopardy. It would put at risk our role as a leader in science and high technology, our ability to compete in the world marketplaces of today and tomorrow, and our ability to make and fulfill international commitments.

As I said, much more is at stake than Space Station Freedom. If Freedom is cancelled, we would undercut a major U.S. market area of world class competition in aerospace. This is one of America's most important industries, and it is one of the few areas that we still enjoy a favorable balance of trade—nearly $28 billion in 1990.

Freedom will drive advancements in aerospace. Some of the technologies and systems that will be driven by Space Station Freedom and will therefore pay dividends here on Earth are environmental control and life support, power generation, thermal control, health care, data processing, and so forth. Also, Freedom will enable America to conduct scientific investigations in both materials sciences and biotechnology in a premier space laboratory.

Thirdly, America's credibility is on the line of our pledges and guarantees to our partners. The magnitude of the government-to-government agreements is unprecedented, and I know that you're going to be hearing more about this in this hearing this morning. The 1958 Space Act that formed NASA directed the Agency to ensure that space is an area of peaceful cooperation with our friends and allies, and Space Station Freedom is the greatest tangible evidence and example of our desire for peaceful technological cooperation and coexistence. If we renege on these international obligations, America's word will be in question. The international ramifications of our backing out of these agreements cannot be exaggerated.

Fourthly, cancellation of Space Station Freedom would cause a total disruption to the planning of all of America's manned space endeavors, and I would predict it would be followed shortly by a disruption of planning in our unmanned and robotic science endeavors as well. Space Station Freedom does not stand alone in the fabric of the NASA budget. It is woven into the fabric of our space science, space transportation, space tracking, people, and facilities programs across the Agency, and the Appropriations Committee mark totally misses this point.

Even more, I believe the greatest single inspiration of the Space Program and Space Station Freedom, and one that was touched on very eloquently by Mr. Darman, is the inspiration to our kids, to our children, the next generation, to inspire them to make science and technology their life's work. For over a generation, the manned aspect of the Space Program has been the focal point for public support of America's efforts in space. The Space Program is about being number one. It's about discovery, it's about knowledge, it's about the future — the very things that drive young people to break the bonds that hold them and to go get an education and seek to be a part of that future.

The Space Program is not a frivolous adventure with no real payoffs, something that can be put off until tomorrow. Space, I believe, is the challenge of our age, and the restoration of funding for Space Station Freedom is important to NASA, to our Nation, and to our international partners. Space Station Freedom is a research facility that will far exceed your expectations of me and of NASA. America will reap incredible benefits, as will future generations of our young people.

I appreciate the opportunity to appear before you today and to try to answer any questions that you have as you face up to this, and I'm also pleased to remark that I've been asked many times about the support that NASA and the Space Program has received from the White House and the President, and I think Mr. Darman's testimony to your committee just now put that question to rest.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Truly follows:]

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Statement of
Richard H. Truly, Administrator
National Aeronautics and Space Administration
before the
Committee on Science, Space and Technology
House of Representatives

Mr. Chairman and Members of the Committee:

America's civilian space program is under fire in Congressional budget deliberations today, at the very moment that it is most crucial to our national economic well-being, national pride, and national education objectives. I want to thank you for giving the Administration and our international partners an opportunity to underscore the fact that America has a great deal to lose as a nation if those budget deliberations result in the cancellation of Space Station Freedom. Funding for this important initiative must be included in the FY 1992 Congressional budget and, with your support, it will be.

Mr. Chairman, development and assembly of Space Station Freedom is our commitment to furthering America's leadership in space. To turn our back on funding Freedom would eliminate a permanent American presence in space and put our space program in great jeopardy. It also would put at risk our role as a world leader in science and high technology, our ability to compete in the world marketplaces of today and the emerging markets of tomorrow, and our ability to make and fulfill international commitments.

Despite what the critics say, investment in Space Station Freedom does not sacrifice domestic programs; Space Station Freedom is a domestic program of the utmost importance to our people. The 100,000 American jobs tied to it today, and the additional jobs and economic opportunities that will emerge from it tomorrow, will be right here in the United States. The dollars being spent on space programs are not put into orbit; they are spent here in the United States and help drive our local economies from coast to coast.

So the issue before Congress is not one of funding space versus funding domestic programs. The issue involves whether we have the willingness to think ahead and plan for the future, while we continue to address the problems that face us today. We have a grand opportunity now to build on the investment we have made to date so that in the next century our children will truly benefit from the actions we have taken. If we do not make these investments, what will we say as a nation to our grandchildren in the next century when they ask us why the citizens of other nations are reaping the benefits of space-based activities and technologies and we are not?

At a 1979 Senate hearing, James Michener said,

> "the nature of human intelligence is such that no one today can even guess the limits of either the personal items or the industrial benefits which might accrue from the basic scientific work that has to be done in a space program. I have followed our past space adventures about as carefully as an uninstructed layman could, and I have a rather imaginative mind, but I anticipated almost none of these significant by-products, and I doubt if any of us in this room today could predict where the next contributions will be made."

That was true in 1979, and it's true today -- nobody can begin to imagine the ultimate benefits of our civil space program and a space-based research facility called Freedom.

I want you all to know, as you and your colleagues assess the proposal of the House Appropriations Committee, that more is at stake here than an American space station.

First, if Space Station Freedom is cancelled, we would undercut a major U.S. market area of world-class competition -- aerospace. Aerospace is one of the United States' most important industries, and it is one of the few areas in which we still enjoy a favorable balance of trade, nearly $28 billion in 1990. In fact, the trade surplus in aerospace exceeds that of any other industrial sector. Space Station Freedom will drive advancements in aerospace that will maintain our leadership in this important technology area.

Technologies and systems that will be advanced as part of Space Station Freedom development and operation include environmental control and life support, power generation, data storage and management, thermal control, crew health care, data processing and distribution, structures and materials, robotics and automation, and operations and maintenance techniques and logistics support. As in the past, much of this will spin off into Earthbound applications.

Second, Space Station Freedom also will enable America to conduct basic scientific investigations in materials science and biotechnology in a premier space laboratory for extended periods. Specific experiments during the initial operations of Freedom will include crystal growth of semiconductor materials and proteins. The results of these experiments will lead to new knowledge for the semiconductor and biotechnology fields on Earth, and may open the door to eventual production of unique products from space for America. When Freedom's crew is aboard full time, emphasis will shift to life sciences research, where much will be learned about human physiology, so necessary for long-term space flights of the next century. The benefits of space biomedical research to terrestrial medicine have already been established, and we expect many more advances applicable to Earth-bound medicine from Space Station Freedom in the areas of bone demineralization (osteoporosis), cardiovascular function, cancer induction, and vestibular disorders.

Third is America's credibility -- the solemnity of our pledges and guarantees. We have negotiated government-to-government agreements with our allies and friends, the nations of the European Space Agency, Japan, and Canada, to build a permanently manned space station composed of U.S. and international elements. The magnitude of the government-to-government agreements is unprecedented. The United States invited these nations to participate, and they responded by adjusting their short- and long-term space plans to take part. The Space Act directs NASA to ensure that space is an area of peaceful cooperation with our friends and allies, and Space Station Freedom is the greatest tangible example of our desire for peaceful technological cooperation and coexistence.

If we renege on these international obligations, America's word will be in question, and our ability to negotiate international science and technology agreements will be seriously eroded. We have received letters from all the international partners stressing that future joint projects will be jeopardized if the United States terminates Space Station Freedom. The international ramifications of our backing out of these agreements cannot be exaggerated.

Fourth, cancellation of Space Station Freedom would mean a total disruption of America's manned space endeavors. This action would have a devastating impact upon the unique and highly refined institutional base resident at NASA and its contractor/university teams. The current NASA program is very interdependent. Space Station Freedom does not stand alone. It is woven into the fabric of our space science, space transportation and space tracking programs. Cancellation of Space Station Freedom would place in danger the Advanced Solid Rocket Motor program, the New Launch System, our Spacelab missions and life sciences research and development, to name a few.

But, in my opinion, even more than economic opportunities, national credibility, economic competitiveness, and scientific opportunity are at risk. At stake is the greatest single inspiration to our children, to the next generation, to make science and technology their life's work. Seeing our astronauts working in space inspires our children and signals to them that, someday, they too may help lead America into the future. For over a generation, the manned aspect of our space program has been the focal point for public support of America's efforts in space. Cancellation of NASA's largest program, Space Station Freedom, is tantamount to betraying the public trust and confidence in America's future.

To quote once more from Mr. Michener's testimony:

> "...There are moments in history when challenges occur of such a compelling nature that to miss them is to miss the whole meaning of an epoch. Space is such a challenge... Therefore, we should be most careful about retreating from the specific challenge of our age. We should be reluctant to turn our back upon the frontier of this epoch. Space is indifferent to what we do; it has no feeling, no design, no interest in whether we grapple with it or not. But we cannot be indifferent to space, because the grand slow march of our intelligence has brought us, in our generation, to a point from which we can explore and understand and utilize it. To turn back now would be to deny our history, our capabilities."

Mr. Chairman, for those of us who have spent a lifetime working in the space program, space is more than a job -- it is the realization of our nation's destiny. I realize there are people out there who think that the space program is a frivolous adventure with no real payoffs, something that can be put off until tomorrow. But these people have failed to learn the lessons of history and fail to appreciate the power of ideas and the value of exploration. Space is the challenge of our age, and the restoration of funding for Space Station Freedom is important to NASA, our nation, and our international partners. If this Congress provides the required funds and permits NASA to turn this project into a reality, I guarantee that you will get a research facility that will far exceed your expectations. America will reap incredible benefits, as will future generations of our young people. Mr. Chairman, great nations do great things -- so let's build Space Station Freedom to manifest the resolve and commitment of the United States to maintain world technology leadership in the 21st century!

The **Chairman**. Thank you, Admiral Truly.
Dr. Boright?

STATEMENT OF DR. JOHN P. BORIGHT, DEPUTY ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY AFFAIRS, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, DEPARTMENT OF STATE, WASHINGTON, D.C.

Dr. **Boright**. Mr. Chairman and members of the committee, I am extremely pleased to be here today to present the views of the State Department on the importance of Space Station Freedom.

I have a statement which has been submitted. Particularly in view of the eloquence of the comments that have already been made, I will be very brief, but if you would permit me, I would like to make a couple of points that are particularly relevant to the international context.

The **Chairman**. Your full statement will appear in the record, and you may proceed.

Dr. **Boright**. Mr. Chairman, our concern for the Space Station Program is based on the conviction that certain concepts are fundamental to the relationship of the U.S. to its major allies and friends, and those concepts include leadership (which has a component of technological and economic competitiveness) reliability, and partnership.

Many obvious points have been made on leadership and on reliability. I will skip over what I was going to say on that. With regard to competitiveness, though, I would like to add that cooperation and competitiveness are sometimes considered mutually exclusive. In fact, properly pursued, they can be complimentary. The key point is that those who cooperate are—both of them, all of them—the winners relative to those who do not cooperate, and we have a choice here to make as to whether we are going to be cooperating with major friends and allies or perhaps sitting back, withdrawing, and seeing what they can do without us.

The point has been made repeatedly, and I think will be made again by our international colleagues who you've asked to testify, that leadership and honoring one's commitments are inseparable. When President Reagan announced a permanently manned space station, he also announced at the very beginning that he was inviting our friends and allies to join us in the endeavor. They, I suspect, will tell you something about their own considerations in deciding how to respond to that invitation. In the end, all of those friends and allies decided to join the Space Station Program—I think quite an interesting point. They had confidence in American leadership. Together the partners have made already a very substantial commitment and have already spent a very substantial amount of money.

We did experience some initial difficulties, which, again, I'm confident will be explained to your satisfaction. Where we are now, though, is a tribute to the effort of NASA and of its partners. They have made a major effort and, we believe, scored a resounding success in living within all of the many constraints that have been placed on them. It seems clear that a failure by Congress to support the Space Station would undercut U.S. leadership, undermine our credibility, and transform a pioneering science and technology partnership into a substantial setback for the whole concept of joint action on manned space programs.

Our partners have been communicating with us. I will not quote their letters and communications. You will have a more eloquent recitation of them in your next panel. They have made it clear that the credibility of the United States is at stake.

To move, if I can, Mr. Chairman, to my last point, I would like to say that these points are not new. Our partners have been making these same points—which you will hear—and the Administration has been making these same points, from the beginning of this program.

The key for us, I think, is that the interests of the United States will increasingly frequently require cooperative efforts with friends and allies, whether it be in space or environment or health or basic sciences. Our partners have learned some difficult lessons in the art of cooperation for mutual benefit, and they may well continue the Manned Space Program without us. The choice for America is whether we, in cooperation with these partners, continue the exploration of this great human technological and scientific frontier.

Mr. Chairman, we should keep this program alive and healthy. Thank you.

[The prepared statement of Dr. Boright follows:]

Testimony of

John P. Boright

Deputy Assistant Secretary for Science and
Technology Affairs, Bureau of Oceans and International
Environmental and Scientific Affairs, Department of State

before the

Committee on Science, Space and Technology

of the

U.S. House of Representatives

June 4, 1991

Mr. Chairman and Members of the Committee,

I am pleased to have this opportunity to present the Department of State's viewpoint on the importance of Space Station Freedom.

The State Department strongly supports Space Station Freedom. Because of the Space Station's major foreign policy dimensions, we are deeply concerned by the recent move in the Congress to kill this important program. We support continued funding for the Space Station consistent with the President's Fiscal Year 1992 budget request and with last year's Budget Enforcement Act as they pertain to domestic discretionary spending.

Our concern for continuance of the Space Station program springs from the belief that a successful foreign policy must be rooted in concepts fundamental to the relationship of the U.S. to its major friends and allies: leadership, competitiveness, reliability, and partnership.

Leadership. Our civil space activities, particularly NASA's manned space programs, have made a major contribution to U.S. prestige and influence over the past three decades. Space Station Freedom is the centerpiece of our civil space program for the 1990's, the successor to Gemini, Apollo, and the Space Shuttle. But beyond its role in keeping the United States on the cutting edge of space exploration and research, Space Station Freedom can also be a means of exerting U.S. leadership and cementing relations with key allies.

Military power and security cooperation will not disappear in our relationships with traditional allies. But as we move toward a new world order, the United States must look for new and fresh ways to interact with old and valued partners. One such means of strengthening our alliances is through cooperation on major science and technology projects like Space Station Freedom.

Competitiveness. It sometimes seems that cooperation and competitiveness are mutually exclusive; in fact, properly pursued, they can be complementary. Going forward with the Space Station cooperation will benefit all participants at the expense of non-participants while keeping U.S. industry in the lead in key areas of space technology. If we terminate the program, we stand to lose both the benefits of cooperation and the enhancement of U.S. competitiveness.

Reliability. There is little distinction between leadership and honoring one's commitments. Space Station Freedom has been an international initiative from the very start. When President Reagan announced in January 1984 that he was directing NASA to develop a permanently manned space station, he also announced that he was inviting our friends and allies to join us in the endeavor.

Nine members of the European Space Agency (Great Britain France, Germany, Italy, the Netherlands, Spain, Belgium, Denmark, and Norway), as well as Japan and Canada, accepted President Reagan's invitation. In 1988, after almost three years of detailed negotiations, we hammered out a multilateral agreement on long-term cooperation in building and operating the Space Station. Eleven other governments joined the United States in this cooperative venture.

It is important to bear in mind that the Europeans, Japanese, and Canadians accepted our invitation only after lengthy internal consideration and debate. The Canadians and Japanese had doubts about making such a large proportion of their space programs dependent upon a cooperative program with the U.S. One-half of Canada's expenditures on space go to the Space Station; the entire Japanese manned space program has been structured around the Japanese Experimental Module (JEM), their contribution to the Space Station. In Europe there was intense debate between those who favored cooperation with the United States and those who preferred investing in autonomous programs competitive with our own.

In the final analysis, our allies decided to join the Space Station program because they were prepared to make a major commitment to a permanently manned space station program, they valued close ties with the United States, and they had confidence in American leadership. Together, our international partners are committed to investing roughly eight billion dollars in the program. More than one billion of this has already been spent. They will incur significant additional costs related to U.S. withdrawal from the program.

Partnership. After some initial uncertainties, the cooperative aspect of the Space Station program has become a noteworthy success story. Dozens of thorny issues arose in negotiating the Intergovernmental Agreement on Space Station Cooperation, and each of the twelve partners had to strike a delicate balance between the requirements of partnership and protection of national interests. The agreements signed in 1988 provide a solid foundation for long-term cooperation among the partners.

During the first year of cooperation, there were some complaints from the partner space agencies that they were not always consulted as early or as fully as they wished. These complaints were fully aired at a government-level review of the cooperation held at the Department of State in September 1989.

Corrective actions were quickly taken. As a result, the effort over the past six months to re-design the Space Station to bring it into conformity with budget limitations set by Congress last year was a resounding success from the standpoint of working relations among the space agencies. Indeed, the cooperative spirit developed during those difficult days served to cement the partnership.

Foreign Policy Repercussions. In light of these factors, it seems clear that a failure by Congress to support the Space Station would undercut U.S. leadership, undermine U.S. credibility, and transform a promising science and technology partnership into a substantial setback for the whole concept of joint action on manned space programs.

Over the past few days, high-level European, Japanese, and Canadian officials have written to the Vice President, to Secretary Baker, and to NASA Administrator Truly to register their deep concern over the Space Station budget situation and have directly explained this concern to the Department of State. As the Canadian Ambassador recently reminded us, "to participate in this program, Canada had to reorient its space priorities and identify adequate long term funding. That this was accomplished at a time of severe fiscal constraint in Canada is an indication of the priority the Canadian Government gives to the Space Station program."

A failure by Congress to support the Space Station at this late date, after so much time, common effort, and money has already been expended would be a particularly bitter pill for our allies to swallow. The partners have expressed consternation that, after an immense effort to re-design the Space Station to bring it into conformity with budget limitations set by Congress last year, the Congress now seems to be on the verge of killing the entire program.

More significantly, they have also made it clear that the credibility of the United States is at stake and that a failure to fund the Space Station would inevitably have negative consequences for future cooperation on other large-scale space and other science and technology endeavors. As Japanese Foreign Minister Nakayama put it in his letter to Secretary Baker, "in the unfortunate event that it became impossible to implement this program because of the budgetary difficulties of the United States, major joint efforts which the international partners have so far made would be nullified, Japanese space development programs would be significantly impaired, and furthermore, I fear that the credibility of the United States as partner in any major big science efforts would inevitably be damaged."

Jean-Marie Luton, Director-General of the European Space Agency, pointed out in a recent letter to the Vice President that the Space Station "builds on thirty years of space cooperation between Europe and the United States, from small science satellites to Spacelab. It commands importance at the highest political levels in Europe, and, based on the United States' assurances following President Reagan's invitation to join the project, has been made a cornerstone of ESA's Long-Term Space Plan."

As Canadian Ambassador Burney wrote to Secretary Baker, "If the United States were to withdraw from Space Station, it would be a serious failure in establishing the collective confidence necessary for international cooperation in space and undermine the basis for future initiatives in this area."

None of this is new, I might add. The international partners have made essentially the same points repeatedly over the past three years, even at a hearing of this Committee on January 30, 1990. And make no mistake; the interests of the United States will more and more frequently require cooperative efforts with our friends and allies, whether it be in space, or environment, or health, or basic sciences.

As was noted at the time of the signature of the Intergovernmental Agreement, the significance of this cooperation extends well beyond the immediate objective of building a manned space station. This project also is a shining symbol of the commitment of those who place a high value on political and economic freedom to cooperate for mutual benefit. It is not for nothing that we, the world's foremost democracies, have chosen to call the project Space Station Freedom. In the decades ahead, we know that the democratic values of individual initiative, human ingenuity, and intellectual freedom--so critical to scientific progress--will be ever more essential to national success.

Our partners have learned the difficult art of cooperation for mutual benefit and might well continue manned space cooperation without us. The choice for America is whether we, in cooperation with these partners, continue the exploration of this great human, technological, and scientific frontier.

We need to keep this program alive and healthy.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

RICHARD G. DARMAN

On January 25, 1989, the Senate confirmed Richard G. Darman as Director of the Office of Management and Budget, and President Bush named him to his Cabinet.

Prior to joining the Bush Cabinet, Mr. Darman was a Managing Director of Shearson Lehman Hutton Inc. He joined Shearson in April 1987 upon resigning from service as the Deputy Secretary of the U.S. Treasury.

At Treasury, Mr. Darman was a key negotiator of the comprehensive tax reform legislation enacted in 1986, and of the international economic policy agreement known as "Plaza I" and related agreements among the Group of Five and Group of Seven industrial countries.

Prior to assuming his position as Deputy Secretary of the Treasury in February 1985, Mr. Darman served in the Reagan White House from January 1981 to January 1985 as Assistant to the President of the United States and Deputy to the Chief of Staff. He helped negotiate the budget and tax acts of 1981, the tax reform act of 1982, and the Social Security compromise of 1983. He was a member of the U.S. delegation to the summit meetings of industrialized countries from 1981 through 1986.

In the Ford Administration, Mr. Darman served as Assistant Secretary of Commerce for Policy. In addition to serving at the White House and OMB, Mr. Darman has held senior policy positions in six U.S. Cabinet Departments: HEW, Defense, Justice, Commerce, State and Treasury.

Mr. Darman's private sector experience has included the following in addition to his tenure at Shearson: Fellow of the Woodrow Wilson International Center for Scholars; Principal and Director, ICF Incorporated; member of the faculty of Harvard's Graduate School of Government; Director, American Capital and Research Corporation; Trustee, the Brookings Institution; and Contributing Editor, U.S. News and World Report.

Mr. Darman was born in North Carolina on May 10, 1943; and was raised in Rhode Island and Massachusetts. An honors graduate of Harvard College and Harvard Business School, he is married to Kathleen Emmet, Ph.D., a writer. They have two sons and live in Virginia.

Biographic Resume

JOHN P. BORIGHT

John P. Boright, Deputy Assistant Secretary of State for Science and Technology Affairs in the Bureau of Oceans and International Environmental and Scientific Affairs, was born on March 1, 1943 in Barre, Vermont. Following completion of his secondary education at Peoples Academy in Morrisville, Vermont, he received a Bachelor of Arts degree in Physics in 1965 from Cornell University, graduating Magna Cum Laude with distinction in all subjects. He was also a recipient of a Cornell National Scholarship, and is a member of Phi Beta Kappa. He received a Doctor of Philosophy degree in Physics from Cornell University in 1970 with thesis work based on a particle physics experiment.

Dr. Boright, currently a member of the Senior Executive Service, served with the U.S. Arms Control and Disarmament Agency from 1970 through 1975, and again in 1976 following a one year assignment to the U.S. Mission to the International Atomic Energy Agency in Vienna from 1975-1976. His service with the Department of State began in 1976 as Office Director of the Office of Nuclear Technology and Safeguards in the Bureau of Oceans and International Environmental and Scientific Affairs. He served in that position until 1980 when he became Acting Deputy Assistant Secretary for Nuclear Energy and Energy Technology Affairs, a position he held until 1982. From 1982 to 1986 he served as Counselor for Scientific and Technological Affairs at the U.S. Embassy in Paris, France. Upon his return from France in 1987, Dr. Boright served for two years as Director of the Division of International Programs at the National Science Foundation. He assumed his present position as Deputy Assistant Secretary for Science and Technology Affairs in November 1989. In this capacity, he oversees U.S. science and technology agreements with other countries, international space policy and program matters, and the science officer system at U.S. Embassies.

Dr. Boright received the Arms Control and Disarmament Agency Superior Honor Award in 1976, the Department of State Superior Honor Award in 1982, and the President's Meritorious Executive Award in 1982 and again in 1989.

In addition to his native English, Dr. Boright speaks French, and has a working knowledge of German and Russian.

Dr. Boright is married to the former Gerlinde Wayd. They have two children, a daughter currently serving in the Peace Corps in Niger, and a son currently a Senior at Tufts University.

The CHAIRMAN. Thank you very much, Dr. Boright.

I'm going to ask just one question before I turn to Mr. Cramer, who is the next questioner.

LIMITS ON SPACE STATION SPENDING

The. CHAIRMAN. Admiral Truly, there have been contentions from a number of uninformed people that the station could grow into a monster which would eat up a large share of the massive budget if we're not extremely careful. I want you to firmly assert that the guidance you've received is not to go above 20 percent of the NASA budget on Station, that even at the $2.5 billion per year level you are not approaching 20 percent, but are probably closer to 15 percent, and that that is a very reasonable and makeable limit for Space Station as a part of the overall NASA budget.

Adm. TRULY. Mr. Chairman, over the past several months or many months since the appropriations bill for 1991 was passed last fall, we have worked very diligently within NASA and with our partners to present a restructured Space Station that abides by the profile as given to us by the Appropriations Committees. Internal to NASA, that program had two cost analyses done on it. Before I was willing to send it to the Office of Management and Budget, I sent it back again and had our Comptroller evaluate it. After it got to the OMB, it was scrutinized at that level again, and there have been a number of hearings in the Congress this spring.

I am very confident that the proposal that we have brought to the Congress for the restructured Space Station is on good, sound financial planning ground, and the numbers that go up to the $2.5 billion limit are outlined for the committees in the Administration's presentation to you. I'm very comfortable with the numbers.

The CHAIRMAN. Mr. Cramer?

NASA PROGRAMS NO LONGER REQUIRED WITHOUT STATION

Mr. CRAMER. Thank you, Mr. Chairman, and thank you, Admiral Truly and Dr. Boright, for appearing before this committee.

I have only a few questions for you, and I, too, am very troubled by the actions of the Appropriations Committee, and I am a brand new member of this so-called authorizing committee here, and, Admiral Truly, we've taken you in the past through the line items of the NASA budget, but in your statement, you've spoken to the fact that it's very clear that the Space Station money in the NASA budget is woven through the different programs, and there are different programs that are dependent upon one another. But if the Space Station Program were cancelled, what other NASA programs would no longer be required or would be jeopardized to the point that they would no longer be required?

Adm. TRULY. Space Station has been a part of NASA's planning now for seven years. If the Space Station development money was zeroed, it would take a very careful analysis to go through almost every appropriation that we have in science, in transportation, in people, in facilities, in construction of facilities, and throughout the entire agency to even find in a professional manner precisely those programs that are designed specifically for Station. Some programs come immediately, you know, under that observation. One was discussed a few moments ago, which was the advanced solid rocket motor.

The advanced solid rocket motor has two major purposes. One is to increase—which are very familiar to this committee, since the advanced solid rocket motor was born out of this committee's review following the Challenger accident in 1987—or 1986. Those two reasons are the additional safety and reliability of the motor for all shuttle flights and the large increase in performance. Today, the single known specific use of that performance increase is the Space Station Program. It is woven into—that is a good example of how it is woven into the Space Station Freedom planning and would have to be reexamined.

SPACE STATION COSTS TO DATE

Mr. **CRAMER**. How much have we spent to date on the Space Station Program?

Adm. **TRULY**. I asked that question this morning before I left, so I might stand to be corrected. We have spent about $5 billion in R&D money, another $600 million or so in other supporting costs, and all of those are a part of our projection of the total development cost. So those monies have been well-spent to come to this point.

Mr. **CRAMER**. Thank you, Admiral Truly.

Thank you, Mr. Chairman. That's all I have.

The **CHAIRMAN**. Mr. Schiff? He left.

Mr. Zimmer?

TIME/COST ESTIMATES TO MEET INTERNATIONAL OBLIGATIONS

Mr. **ZIMMER**. Thank you, Mr. Chairman. I appreciate the opportunity to participate in this hearing.

I believe strongly in the future of American manned space exploration, and if I thought that the Space Station Freedom was the best way to advance space exploration, I would be as strongly in favor of it as you are, Mr. Chairman, and as so many of my colleagues on this committee are, as are the witnesses before us. But I'm a newcomer to the committee, as is Mr. Cramer, and I've had the opportunity to review the Space Station Program with a fresh eye, and I've reluctantly concluded that instead of furthering our goals in space exploration, the Space Station will actually impede America's progress. It will absorb all the available dollars in NASA's budget, starving smaller important and highly promising projects.

Its original mission has been so drastically curtailed, its cost has run up so far, and its schedule has slipped so much that its objectives can be better achieved with less money on smaller, more mission-oriented spacecraft. The various other goals of this program that have been mentioned, such as maintaining our space industry, providing America with a permanent presence in space, and creating enthusiasm among the next generation of astronauts can also be better realized with less money and probably in less time.

Our shuttle fleet has been unable to sustain a regular flight schedule. The Augustine Committee has predicted another Challenger-like disaster in this decade. This does not bode well for

Space Station Freedom, which will require more than 20 flights to assemble and many more to maintain. We're making a big mistake if we bet the ranch on this Space Station. In its current scaled-down configuration, Space Station Freedom could better be called Space Station Lite— one-third the mission for nearly four times the price.

Now, I'm as concerned as many of the members are about our international obligations, but I have a terrible fear that we may spend more money and get more money from our international partners to be invested in this program and leave them high and dry later on because of the unwillingness, evidenced by the vote of the Appropriations Subcommittee at this point, to sustain a commitment of the magnitude that is going to be required for the next several years, and if I have the opportunity, I want to get into the exact size of that financial commitment on our part. But as I understand it, our international obligations require an eight-man crew and 75 kilowatts of power, and neither of those objectives are currently within the scheduled budget of NASA until the end of the century. They are follow-on programs.

Admiral Truly, can you tell me when we will be able to achieve the eight-man crew and 75-kilowatt capacity so that we can meet the obligations to our international partners and how much that will cost?

Adm. TRULY. Thank you, Mr. Zimmer.

I must say that I'm very sorry, with all due respect to your points of view about the station, that NASA has been unable to point out to you that in fact the restructured Space Station proposal to the Congress is one of great and world class capability, and we're totally convinced that the transportation support for it is rational.

As to the size of the international commitments, I think it would be very helpful when the representatives from the other nations and the European Space Agency that are our partners in this could speak to the same ones. The eight-man crew and the 75 kilowatts are goals that are clearly laid out in the original intergovernmental agreement with the partners. When we went through the restructured Space Station with the monies available, we agreed with the partners that the presentation to the Congress would arrive at a permanently manned configuration of a four-man station and that the eight- man crew and the 75 kilowatts of power would be addressed beyond the scope of this budget submission.

Mr. ZIMMER. So you can't answer either question? You can't tell me when they will be achieved or at what cost?

Adm. TRULY. I can't tell you when, because we're debating whether or not to have a Space Station. In our restructured program, we clearly have laid out that those are still commitments that we regard to our international partners but are not part of the permanently manned configuration as of the end of this decade.

Mr. ZIMMER. Thank you.

The CHAIRMAN. The Science, Space, and Technology Committee is sometimes accused of being monolithic supporters of everything that NASA does. We keep Mr. Zimmer on the committee to make it clear that that's not true, Admiral Truly.

[Laughter.]

The CHAIRMAN. Mr. Andrews?

STATION AS THE FOUNDATION FOR THE U.S. FUTURE IN SPACE

Mr. ANDREWS. Thank you very much, Mr. Chairman, and thank you for letting me join the committee this morning.

As I have listened to the testimony today, I can't help but think back that over 25 years there have been a lot of important hearings in this room, and the pace that NASA and our Nation has set in space has certainly been a breathtaking one. The trophies are on display here from the Gemini Program, the Apollo Program, the Mercury Program, all advancements that have thrilled generations, and, Admiral Truly, I think you're absolutely right. I can't think of a more important hearing and an important issue than we face today.

There have always been voices like Mr. Zimmer's that were quick and ready to find fault with the program and try to stop the program, try to stop our efforts, and they've always failed, but this is the biggest test, probably the biggest test that NASA has faced in the history of the country's Space Program. There is no question that the Space Station is the linchpin of our future in manned space flight. If we kill the Space Station, we stop the Space Program dead in its tracks. I mean, that's the issue that the Congress will face this week on the House floor: to keep the Space Station alive, to move our Space Program forward, or to stop it dead.

Admiral Truly, I wonder if you would tell the committee in a general sense and as specific as you can in the time that I've been allocated exactly why do you think the Space Station is such a foundation for our country's future in space, and what do we hope to learn there?

Adm. TRULY. Mr. Andrews, the subject of a space station and its specific design has been a part of space program planning since Werner Von Braun wrote articles for Colliers magazine years before the 1958 Space Act. Every nation that has envisioned a space program has envisioned first a series of events that led to a space station and then beyond. The Soviet Union has had its form of a space station in orbit now for about a decade, but the MIR Space Station of the Soviet Union pales in comparison to the international Space Station Freedom, which is a partnership between the United States, Canada, Japan, and the European Space Agencies.

It is the linchpin of the planning for the manned programs. It is the only way to put humans in space and to learn about their physiology to allow generations in the next century to move even farther. It is an excellent facility to do things like microgravity processing and research. It has been a part of NASA's planning and America's Civil Space Program planning since John Kennedy talked about and challenged the Nation to start the Apollo Program and go to the Moon.

Alan Shepherd, John Glenn, the early Mercury crewmen, realized at the time of their flights that eventually this Nation, if it was going to continue to expand its role in space, would have to go through the process of a space station, and now this year we come to the Congress after a program that has been in development for seven years, we have spent $5 billion in its development and definition, we have formed the largest cooperative international project that is possible to form—and I think you'll hear in subsequent speakers that we are truly partners in this and working very well together—and I say again that I think that this issue and this hearing and the floor debate in the next few days, if it remains on schedule, are the most important debate about America's Civil Space Program—not just Space Station, but Civil Space Program—because the station is such an integral part of that fabric.

Mr. ANDREWS. Thank you very much, Admiral Truly.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Andrews, and, of course, I should have pointed out that you were a very valuable member of this committee before you chose to undertake a different path. I hope you don't regret it too much.

[Laughter.]

The CHAIRMAN. Mr. Rohrabacher?

ADVANCED SOLID ROCKET MOTOR

Mr. ROHRABACHER. Thank you very much, Mr. Chairman.

Admiral Truly, isn't it true that the reason for augmenting the ASRM budget by $125 million above the budget request was to have it available for Space Station assembly?

Adm. TRULY. Yes. In the restructured program, we saw a threat to the schedule, and we have pointed out to this committee and to the Appropriations Committee in order to sync up the Advanced Solid Rocket Motor to the most optimum point in the Space Station assembly schedule that we needed about that amount of money to ensure that the Advanced Solid Rocket Motor would meet that particular flight in the Space Station assembly.

Mr. ROHRABACHER. So there are a lot of other projects that are on the line here today rather than just Space Station.

Adm. TRULY. That is my point, that NASA's planning has been so integral assuming Space Station for the past seven years that various projects exist because of our belief in the commitment that we had to the Congress and the commitment from the Congress that we should continue that planning.

NATIONAL AERO-SPACE PLANE

Mr. ROHRABACHER. Now, there are those who are fearful that the Space Station, if it moves forward, might actually delete funds and drain funds from other projects like the National Aerospace Plane, for example, which is a project I'm deeply interested in. If Space Station moves forward, would you think that the funds would be available—for example, when we get to the point where we have to build the X-30 in the next couple of years—that those funds will be available and not drained away by Space Station?

Adm. TRULY. My personal opinion is that the loss of Space Station would actually hurt the argument for obtaining the funds to build the research vehicles, because to kill the Space Station would send a signal that we're not interested in the future and that our National Aero-Space Plane clearly is a technology that's farther down the road than Station. As we all know, the funding for the research vehicles for the National Aero-Space Plane is going to be a major issue in whatever year it's finally dealt with, but if Station is killed, those dollars are not going to go to any NASA science or technology project. They're going to go to other uses in our society.

Mr. **Rohrabacher**. If the Space Station is fully funded, would you support full funding for the development of the National Aerospace Plane?

Adm. **Truly**. The full funding for the development of the National Aero-Space Plane is going to naturally have to wait the outcome of the phase in that program that we're in today. We're doing very well. It's an issue that's going to be taken up with the National Space Council in 1993. Today I project that I'm going to be possibly the strongest or certainly one of the strongest supporters of funding for it, but, again, I don't see it connected to the Station decision we face today.

Mr. **Rohrabacher**. All right. But the National Aerospace Plane would be a good way to resupply the Space Station. If we ever develop a craft that could fly into low earth orbit from a runway, that would be one way of resupplying a space station, would it not?

Adm. **Truly**. I think that the technologies of the Aerospace Plane are going to be able to support a later downstream support of Space Station or efforts like that. It is not going to come along so fast, though, to be a part of this debate that we're in right now, which is the decade of the 1990s.

Mr. **Rohrabacher**. Well, thank you very much.

Thank you, Mr. Chairman.

The **Chairman**. Thank you, Mr. Rohrabacher.

Mr. Bacchus?

WOULD OTHER SCIENCE & SPACE PROGRAMS BENEFIT FROM STATION CANCELLATION

Mr. **Bacchus**. Thank you, Mr. Chairman.

Admiral Truly and Dr. Boright, thank you for joining us today. As you gentlemen know, I represent an area of Florida which has great interest in the outcome of this decision by the Congress. Frankly, the people I represent can't fathom why a few appropriators have done what they've done. I represent the people who have put Americans on the moon. I represent the people who make the shuttle fly.

I don't know of anyone in this Congress that I hold in higher regard than my friend, Mr. Zimmer from New Jersey. He and I simply disagree on this issue. I think Mr. Zimmer and I have a different perspective. Perhaps it's reminiscent of the age-old dilemma about the glass and whether it's full or not. Mr. Zimmer is looking at this glass and seeing it as half empty, and I see it as half full. He calls this Space Station Lite. It is less filling for now, but it tastes great for our future.

[Laughter.]

Mr. **Bacchus**. Mr. Truly, one ~~of the~~ points Mr. Zimmer raised I think you just answered a moment ago. He says that the money would be spent better on other programs within NASA, in other science programs. This seems to me to be the fundamental fallacy of so much of his argument.

Given the constraints of the budget agreement, given the desires of those people who are making these budget decisions, do you think these monies would be spent elsewhere on science and space?

Adm. Truly. The Appropriations Committee mark zeroed the funds out of the NASA budget for Space Station. They are no longer on the table with regard to that particular mark, and they did not go to science—certainly not to science in NASA. I think what you would see with the loss of Space Station would be over the next two or three years a much larger decrease to NASA funding; therefore, putting even more squeeze on the science programs that we are so proud of.

Mr. Bacchus. Let me follow up on that, too, sir, to ask you again to embellish on something else that you said earlier. I'm concerned about the future of the Manned Space Program. It seems to me that if they kill the Space Station this year, then next year they'll come back and say there's no longer any need to fly the shuttle, and in the following year they'll say there's really no need for a manned space program at all. In the meantime, our friends and allies who have wanted and sought to cooperate with us in Space Station Freedom will be left to their own devices. It seems to me that they'll probably come together and try to build a space station themselves, and then maybe we can borrow it from time to time.

Do you agree with this thinking? Is this a likely outcome of this decision?

Adm. Truly. As I've said several times, I think that this debate is about more than the Space Station; it's about the Space Program. It will undoubtedly come as no surprise to the members of this committee, knowing my background, that I believe that it would be—it's unthinkable that this Nation, based on our history in science and technology and space of the last 30 years, would turn our backs on the manned space efforts. But I think that this brings that issue up, and I do think that if the Manned Space Program is diminished as clearly as this action would indicate that some would like it to be that you would find the entire interest in the NASA Space Program, including our robotic advances and our science programs as well, that would not see the support that they have seen in the past.

So I think this issue is about America's Civil Space Program. Our Civil Space Program is premier in the world, and this issue is about turning away from that.

Mr. Bacchus. Thank you, Admiral.

Thank you, Mr. Chairman.

The Chairman. Thank you very much, Mr. Bacchus.

Mrs. Morella?

NASA Response to Negative Station News Articles

Mrs. Morella. Thank you very much, Mr. Chairman. I appreciate these very distinguished people involved with the Space Program being here.

Admiral Truly and Mr. Boright, yesterday I engaged in a special order on the Space Station on the floor that was just so beautifully handled by the Chairman of this committee and the ranking member of this committee and others who participated. Last evening when I got home very late, I opened one of the news magazines, and, sure enough, there was an article in it which was, I thought, devastating.

I'd like to ask you, because this is a great opportunity for you to respond—the article talked about the initial cost of the Space Station as it was designed, the fact that there has been a cutback of $8 billion, and yet the GAO has estimated that it may in the long run come up to $118 billion. Then comes the statement, "All of this to do nothing." It indicates that the sole scientific rationale left for the station was to conduct biological research on weightlessness, but the plans originally omitted centrifuge, the most important gadget needed to do the work, and that the National Academy of Sciences concluded that the Space Station had no scientific use at all.

I want to refute that. I want to refute that with my colleagues, and so I feel that perhaps you can give us a good start in refuting a statement like that, particularly the statement from the National Academy of Sciences.

Adm. **Truly**. Let me touch very briefly on two or three things. First of all, we stand by our restructured program and the costs of it. It has been briefed to this committee, there has been a number of hearings about it, I believe that those costs are valid, and we have been totally up front with them, and they do not represent nearly the astronomical costs that I have heard thrown around in some previous committee hearings.

It makes me shrink in embarrassment and shame, frankly, to think that someone would say that America's Space Program is all for nothing or that the Space Station Freedom is viewed in that sense. There is going to be world class science to be done aboard Space Station, and it is the only possible location where the human subject can be examined in the environment that it will have to be living in in order to do the explorations of the next century.

Therefore, I think that some of the short term arguments are simply fallacious. The centrifuge that you mentioned in your question has been a plan of the Space Station throughout. We have had, as you know, a number of back-and-forths with our Science Advisory Committees on it, but the restructured Space Station does accommodate it.

That article, which I did not happen to read, I think just totally misses the point about investing in the future. Mr. Darman discussed it earlier. It's always easy to say, "This one's not quite good enough; let's wait for the next one." Well, the next one is going to be generations down the road. There is going to be a world class space station on orbit. It is going to do life sciences research, and it is going to do microgravity research. The question is: Is it going to be Space Station Freedom with the international partnerships that we have created?

So it's a major decision, I realize, that each of the members of the House have—and later the Senate this summer — to face, but I believe that we're talking about nothing less than the Civil Space Program.

STATION'S ROLE IN SCIENCE EDUCATION

Mrs. MORELLA. On another subject, Admiral Truly, I know that you have been a leader in this Administration in attempting to solve our problem in attracting children to science and technology, and as I mentioned before, you were kind enough to come out to one of our magnet schools in Montgomery County, Maryland, and so inspire the students in terms of space science. Do you see that the Space Station plays a role in that effort?

Adm. TRULY. I have spent a great deal of time and interest with young people and with education, and just in my personal experience here in 1991, approximately five years before the first Space Station flight even is to be flown, when I go to classrooms where a teacher has the young people in a science class where the subject, in order to inspire the young people, is about space in general, and I walk in and I look, you know, on the walls with the little models and the pictures that are drawn by the kids, those are pictures of Space Station, astronauts working on a space station that is being built. It most certainly does have an effect, and I think that the manned portion of our program has had an overpowering larger percentage of that effect with the youngest of our kids than any other part of it.

EFFECTS ON FUTURE INTERNATIONAL PARTICIPATION

Mrs. MORELLA. I just got some letters from a class asking, you know, about the Space Station—and this was even before the Appropriations Committee had done anything— about, you know, how it was progressing.

If Mr. Chairman would allow me to ask one question, Secretary Boright, I don't want you to think we're ignoring you at all in the questioning. I thought your testimony was excellent. I might ask you how would cancellation of Space Station affect the prospects for international participation on future large-scale science and technology projects with the United States? We may hear some of that with the next panel, but I'd like to have your point of view on it.

Dr. BORIGHT. I think there's absolutely no question that what we're looking at is a watershed event. We've had some difficulties in the past. We, in dealing with our international partners, run into the history of those difficulties incessantly, but they're small compared with what we're talking about now.

This is going to be something that is going to be, as we say, on our plate every time we go to the table with programs which are going to be of major American interest. They're going to relate to the environment, they're going to relate to engineering and energy, they're going to relate to a whole range of interests that we can't even predict now, and this is going to be there every time we come to that table.

The CHAIRMAN. You didn't mention high-energy physics, Dr. Boright. Would you like to do that?

Dr. BORIGHT. I would like to also mention high-energy physics, Mr. Chairman.

[Laughter.]

Mrs. MORELLA. Thank you, Dr. Boright.

Thank you, Admiral Truly.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Volkmer?

FUTURE OF U.S. MANNED SPACE PROGRAM

Mr. VOLKMER. Thank you very much, Mr. Chairman.

Dick, I think something needs to be said here that hasn't been said yet, and that is, in my opinion, you're caught and the whole program is caught in a conflict, and that conflict is a result of, I think, budgets not only this year, but in the past. It has nothing to do really with the NASA budget, but it has to do with reductions in housing programs, it has to do with reductions in VA medical benefits and VA programs that I have seen since I've been here since 1981.

I was in my district yesterday, and I had veterans still complaining to me, and rightfully so, about the medical care that is not being received at our VA medical centers because of cutbacks, or at least not sufficient appropriations for those.

So I can see how this has happened, and I can see how a program like this is being used to try to address those. That doesn't mean that I support that. I just want to let you know that as one who was the subcommittee chairman back when we started this whole program, I hope to see the day that we are able to continue it and that the House will see the light and somehow we can continue it. Because, in my opinion, it is, as the gentleman from Texas earlier said, it's basically the beginning of the end for the Manned Space Program in the United States as we have envisioned it. It just prolongs any idea of ever going back to the moon or to Mars. Is that correct?

Adm. TRULY. I think that obviously the first result would be the manned—you know, would be a total disruption to all of our plans for the Manned Space Program, but I say again I think that would be followed very quickly by erosion of support for the Civil Space Program in general.

Mr. VOLKMER. Right, and I agree with you, but, I mean, there's no possibility of us or anybody else, without the research that's needed, to take a trip to Mars.

Adm. TRULY. That's right.

Mr. VOLKMER. Without the life sciences that's necessary to be done preliminarily, it's just not possible.

Adm. TRULY. It is—to somehow gain that life sciences information is absolutely a door that must be walked through in order to open up any possibility for anyone in the next century to explore.

ALTERNATIVES TO THE STATION AND NEED FOR OTHER PROGRAMS

Mr. VOLKMER. Right. Now, that's what—the gentleman from New Jersey says there's alternatives. I'd like to hear those alternatives, because as one who has lived with this program, as many of us have, since the time it started, but actually, I guess—actually the proposal was back when we started the space shuttle, wasn't it? There was a proposal back then to do a station and a shuttle, and it was decided you couldn't do both and to do the shuttle.

Adm. TRULY. That's correct.

Mr. **Volkmer**. And it was after we got the shuttle on line that we decided to do the station. So it's not something that just started, and I'd like to hear those alternatives that are going to give us the knowledge and the information that's necessary. How are we going to do that microgravity research? I know there are ways to do parts of it, but to do it for extended periods of time and actually production under microgravity—I just don't know, and I'd like to hear the gentleman from New Jersey give me specifics sometime actually how it's going to be done.

And then there has been no mention of HLV. What are we going to need an HLV for if we don't have a space station?

Adm. **Truly**. The Space Station is fundamental to gain the life sciences information in order to enable exploration by anyone in the next century. The heavy-lift launch vehicle is also another requirement that is needed in order to explore. I think that to what—

Mr. **Volkmer**. But if you don't have the station, why am I going to need an HLV by the year 2000 or 2005?

Adm. **Truly**. I think that's a very good point. You've got to appreciate that if you decide that in fact you absolutely cancel a space station, you're taking the Space Program back to the 1960s, because that's when the Space Station was recognized as a logical part of the Civil Space Program.

Mr. **Volkmer**. And you've already mentioned the ASRM. We won't use the TDRSS near as much as we envisioned to use it. Is that correct?

Adm. **Truly**. We would—the TDRSS supports a number of our satellites—

Mr. **Volkmer**. I understand that.

Adm. **Truly**.—but the outyear plans for the Tracking Data and Relay Satellite fold in requirements for Space Station Freedom, and, obviously, those would have to be backed out of those plans, and I have not taken the time to understand precisely even how that would affect the TDRSS concept.

Mr. **Volkmer**. The other thing, as I looked at what the Appropriations Subcommittee did, I have concerns about the modernization or the continued development on the shuttle— structural spares and that thing—as far as that appropriation is concerned, and that bothers me as to, as has been earlier said, if we don't need that manned presence in space, are we just going to go back to the ELVs? Are we going to use that technology that's been here with us all these years and not develop new technology?

Adm. **Truly**. Well, it's been said here before this morning, but I think the cancellation of Station would invite all those questions having to do with all parts of the NASA plans, including shuttle, tracking, support of future programs, et cetera.

Mr. **Volkmer**. The same way with the long duration orbiter? I mean, why are we going to go to that step? Doesn't it have to be at least looked at?

Adm. **Truly**. All of those things would have to be looked at.

Mr. **Volkmer**. Thank you.

The **Chairman**. Thank you very much, Mr. Volkmer.

I'd like to announce at this time that it's the Chair's intention to complete the questioning of this panel at 11:00, recognizing that all members will not get a chance to interrogate them, but out of respect for our distinguished panel of foreign representatives, I'd like to give them at least an hour of prime time this morning, and those who do not get called on prior to excusing this panel will be the first to be called on with respect to the foreign panel. I think this is the best way to optimize the results of our hearing this morning. Having said that, let me call on Mr. Boehlert next, if he decides to take time.

INTERNATIONAL TREATY STATUS OF STATION AGREEMENTS

Mr. BOEHLERT. I do, Mr. Chairman.

Dr. Boright, I have a letter from the Canadian Ambassador to the United States in which he points out that they're precluded by law from testifying before the committee, but, obviously, they're not precluded from expressing an interest in the subject matter, and among other things, he points out that this is a project to which the United States and Canada are committed by international treaty. Would you address that somewhat?

Dr. BORIGHT. In my prepared testimony, I did include some excerpts from the letter of the Canadian Ambassador. I should perhaps have included it in my oral testimony, given that that's the one partner who is not appearing today.

The CHAIRMAN. Without objection, Dr. Boright, the full text of that letter will appear in the record at this point.

[A copy of the letter follows:]

an Embassy Ambassade du Canada

501 Pennsylvania Avenue N.W.
Washington, D.C. 20001

May 24, 1991

The Honourable James A. Baker III
Secretary of State
Department of State
2201 - C Street N.W.
Room 7226
Washington, D.C. 20520

Dear Mr. Secretary,

I am writing to you to express the serious concern of my Government over recent funding action in Congress that could result in withdrawal of the United States from the international Space Station Freedom Program.

Canada has a long history of space cooperation with the United States, dating back more than thirty years. The Space Station Freedom Program is by far the largest cooperative space venture that either country has undertaken. To participate in this program, Canada had to reorient its space priorities and identify adequate long term funding. That this was accomplished at a time of severe fiscal constraint in Canada is an indication of the priority the Canadian Government gives to the Space Station Program.

The Intergovernment Agreement (IGA) of 1988 on Space Station marked the first time international cooperation in space was legally established in documentation having treaty status. By signing this treaty, Canada was expressing its confidence that a long-lasting international partnership could be established around U.S. leadership that would allow unprecedented cooperation in space. If the United States were to withdraw from Space Station, it would be a serious failure in establishing the collective confidence necessary for international cooperation in space and undermine the basis for future initiatives in this area.

I urge you to do everything possible to reinstate appropriate funding for the Space Station.

Yours sincerely,
Original signed by
Original signé par
D. H. Burney
D. H. Burney
Ambassador

Dr. BORIGHT. But specifically with regard to international commitments, the structure of the arrangements, as you probably know, are an intergovernmental agreement signed by the Secretary of State for the United States and corresponding representatives, a set of Memoranda of Understanding that NASA has with its counterparts, and also an arrangement concerning application of the Space Station intergovernmental agreement pending its entry into force. We can, of course, provide all of those full texts or relevant provisions.

We have, of course, in these agreements, as we always do, provisions that say that implementation is going to be subject to ability of funds and appropriated funds. That is something that is always there that we must put there. There are, of course, withdrawal provisions and so on. But the bottom line is that we have given our word, we have pledged specifically in this arrangement pending entry to force to undertake to the fullest extent possible, consistent with domestic laws and regulations, to abide by the terms of the Space Station agreement, and the Space Station agreements commits us specifically to make efforts to secure funding to implement all of the commitments in that agreement.

Mr. BOEHLERT. Would there be any obligation on our part, if we unilaterally abrogate this international treaty, to pay any penalty to our foreign partners?

Dr. BORIGHT. I might want to refer that to Admiral Truly.

Adm. TRULY. I don't know.

Mr. BOEHLERT. Okay. Admiral, are you saying you don't know, or you're—

Adm. TRULY. I don't believe so, no.

The CHAIRMAN. We'll pay a penalty, but it isn't in the agreement.

Adm. TRULY. We'll pay a huge penalty, but not in the sense of dollar terms.

Mr. BOEHLERT. Dollars and cents.

Dr. BORIGHT. Mr. Congressman, I am reasonably confident the answer to that in the dollars and cents term is no, but we will answer that for the record.

[The information follows:]

The Space Station Intergovernmental Agreement does not provide for penalties in the case of withdrawal by any Party.

Mr. BOEHLERT. Okay.

Dr. BORIGHT. We're much concerned with the broader and deeper and more longstanding penalty we'll pay.

Mr. BOEHLERT. I know both of you—

Mr. MINETA. Would my colleague yield?

Mr. BOEHLERT. I'd be glad to yield to my colleague from California.

Mr. MINETA. Won't the penalty be paid not so much in maybe other NASA programs, but in terms of international cooperative agreements as it relates to Superconducting Super Collider—

Mr. BOEHLERT. Reclaiming my time, that's a very good point.

Mr. MINETA.—which my colleague from New York loves so much.

Mr. BOEHLERT. Yes.

[Laughter.]

Mr. **Mineta**. But aren't there other areas in which we will be paying the price, including children who are in the second grade or third grade today who will be paying the penalty of this kind of an approach?

Mr. **Boehlert**. I thank my colleague for that observation, and that brings me to the next point.

In selling the Space Station—and, incidentally, you don't have to use the hard sell on me—but in selling the Space Station, I would consider withholding the argument that if we don't proceed with the Space Station, we won't get the funding we're seeking from international partners for the Superconducting Super Collider, because I would suggest to you that might prompt people to vote other than the way you want them to vote, because there are a number of people that are assigning priorities and give a much higher priority to the Space Station, for example—and I happen to be one of them — than they do to some of the other projects, the SSC being one in particular.

Admiral Truly, let me ask you this. You have said just recently if we don't go ahead with Space Station Freedom, someone else will. How would you envision the international community responding to our cancellation of progress on the Space Station? In other words, if we close up shop and decide not to proceed, who do you see proceeding under what circumstances?

And I recognize my time is up, so I thank both of you, and I'll be anxious to hear your response.

Adm. **Truly**. I can't be very specific, but I would make the following observation. When the Space Program started, when NASA was formed, there were only two space nations, if you will: the Soviet Union and the United States. Today that is far, far from true. Around the world, many nations have built up a technology capability in space. We are partners in this event with several nations of the European Space Agency, Canada, Japan, but there are many other nations that have a capability.

If the United States walks away from its leadership role in Space Station Freedom, it is going to leave a huge— pardon the term—vacuum in the worldwide, international space arena. That vacuum is going to be filled. Whether it would be filled by the nations that are currently our partners or by them joining others, it would be hard for me to predict. But the price we would pay is that I think it would be very difficult to imagine how they would fill it in a partnership with us.

I agree with your point, incidentally, about making the point of our international word with regard to any other specific program no matter what it is, but if we cancel Space Station Freedom, this committee is going to be discussing this issue on international cooperation for the next decade on many, many programs, and so will other committees of Congress, so in that way I think it is our word that is on the line.

The **Chairman**. Admiral Truly, isn't it at least conceivable that our existing partners might want to join with a revitalized Soviet Union, assuming they can get out of the economic doldrums, which already has a vigorous space program and develop a new European-Soviet-Japanese-Canadian partnership that could go ahead with the Space Station, considering that the Soviets already have a rudimentary space station?

Adm. TRULY. I certainly think that's conceivable.

The CHAIRMAN. Mr. Valentine?

COST ESTIMATE OF INTERNATIONAL CONTRIBUTIONS

Mr. VALENTINE. Thank you, Mr. Chairman.

I have just a couple of questions, and I don't think I will utilize all the time. I would like to, first of all, comment and then ask the panel a question.

You know, a lot of discussion has taken place here about our obligation to our international partners in connection with this worthy undertaking, and I'd like to ask you if you can tell us what is your judgment with respect to the contribution that each of the partners have made, for example, to our effort to restore peace in the Persian Gulf? We're talking here about our obligation to the Japanese and some others. What is your—it seems to me to always be a one-way street. Nobody hoops and hollers and raises hell when the Japanese make some commitment to us to discharge the responsibility to keep the flow of energy flowing to the free world, yet when the shoe is on the other foot, you come in and say—now, don't misunderstand me; I support the Space Station—you say, "Well, you know, we've got to do it because if we don't, our word is on the line." Well, that's a statement, not a question.

But tell me, if either one of you will, what proportion of the cost of this thing has been committed by Japan, Germany, and the others, how much have they given, and what reason do we have to expect that we can depend on them?

Adm. TRULY. Our development cost for Space Station Freedom and the reconstruction program is $16.9 billion. Their commitments, total, are in the range of $8 billion.

Mr. VALENTINE. Half of it.

Adm. TRULY. About half in the long run.

Mr. VALENTINE. How much has been put up so far?

Adm. TRULY. As of today, we have expended funds to the tune of about $5 billion of that $16.9 billion, and it's my understanding that they have already spent about the equivalent of a billion dollars in U.S. dollars in their programs, but I would prefer that they confirm those numbers.

Mr. VALENTINE. Do you have any indication, Admiral, whether they are on schedule?

Adm. TRULY. It's my indication that since each of the partners signed up with NASA on the reconstructed Space Station Program that they were committed to that schedule and that they have the ability to meet it.

Mr. VALENTINE. Do we have any protection? Do we have any kind of contractual treaty guarantee from, for example, the Japanese?

Adm. TRULY. We have an intergovernmental agreement with all of the nations involved which states the United States' commitment and the commitments of the other partners, yes.

Mr. VALENTINE. There is, I think, some reason to be concerned that, based on the history of recent years, that if we develop the

Space Station and if it has a commercial aspect that the center of that might very well be in Tokyo and not in the United States. If there's going to be a round-trip passage from earth to the Space Station, based, as I say, on recent experience, it might benefit some other country more than the United States. I suppose there's no way to guard against that sort of thing.

Adm. TRULY. Dr. Boright may want to comment on this, but one thing is for sure: if we cancel Freedom, it will not be in the United States. I would only comment that I believe that the history in the space programs that I'm familiar with that have an international character is that the best results are when you have a cooperative relationship rather than the divisive results of a race between nations that are not cooperating and discussing problems and working together. That's the worst of all worlds in the space business, as it is in many other parts of international affairs.

TANGIBLE BENEFITS FROM SPACE STATION

Mr. VALENTINE. Well, finally, if I may, Mr. Chairman, I don't know—I wasn't here because there's a little thing going on in the capital of North Carolina called hearings and considerations having to do with redistricting, and I was occupied with that, as some of you here would understand, and I didn't get to hear the beginning of the program.

Can you mention very briefly please, Admiral, or either one of you, what you see as, in addition to opportunities for the scientific and technological development and enhancement, what there is of a tangible nature that we can say to our constituents that will be of benefit to this Nation by proceeding with the Space Station?

Adm. TRULY. Mr. Valentine, I think that the Space Station is central to NASA's planning for the entire Civil Space Program. It is one program that has returned dollars to the American economy over the 30 years of its existence to the tune of about 7:1 for all investments. It will drive us to develop technologies developed by our companies that will be spun off into the U.S. economy. It will make us more competitive. Probably most important of all, I think, it is a bridge to future generations by spending some of our difficult choices in Federal monies for something that will still be here when those generations arrive.

INTERNATIONAL CONTRIBUTION TO OPERATING COSTS

The CHAIRMAN. Thank you very much, Mr. Valentine.

Would you comment briefly, Admiral Truly, on the question of whether or not our international partners are committed to pay a portion of the operating cost after the station is built and, if so, how much?

Adm. TRULY. They are. If I might, I can provide the how much for the record, but, yes, the agreement does involve the not only development, but a fair share of operating costs.

[The information follows:]

INTERNATIONAL PARTNERS' SHARE OF OPERATIONS COSTS

The Space Station International Agreements were structured so that all the partners would pay an equitable share of the operations cost of the Space Station. These costs fall into four categories:

1. Each partner, including the U.S., is responsible for *element - unique costs*, that is, for all costs associated with operating and sustaining the functional performance of the flight and ground elements it provides (provision of spares, launch costs for spares, sustaining engineering and maintenance).

2. The partners each pay a share of *common system operations costs* (the costs associated with operating the Space Station as a whole) equal to their share of utilization resources (i.e., U.S.-71.4%; ESA and Japan-12.8% each; and Canada-3%). Common system operations costs are:

-Integrated tactical planning
-Integrated logistics operations
-Logistics carrier processing
-TDRSS communications for housekeeping data
-Space Station Control Center operations
-Cost of consumables
-Launch costs related to consumables
-Launch costs related to crew

3. Each partner will pay the costs associated with the training of the crew members it provides.

4. Each partner is responsible for the costs of all its user activities including launch costs

The CHAIRMAN. Thank you.

I'm going to recognize Mr. Rhodes at this time, and when he finishes, Mr. Hall for a very brief concluding question, and then we'll go on to the international panel.

Mr. Rhodes?

Mr. RHODES. Thank you, Mr. Chairman.

Admiral Truly, I don't have a question for you. I do for Dr. Boright, but I would like to say that you and I have clashed a couple of times on a couple of elements of the station, but we're not clashing on anything here this morning. I'm with you all the way.

Adm. TRULY. Thank you, sir.

INTERNATIONAL AGREEMENT STATUS

Mr. RHODES. Dr. Boright, I want to go back to the questions that Mr. Boehlert raised concerning the status of these agreements. In a letter dated May 24 from Ambassador Burney to Secretary of State Baker, he says, among other things, "international cooperation on space was legally established in documentation having treaty status. By signing this treaty, Canada was expressing its confidence" and so on, and then in a letter June 3 from the Ambassador to Chairman Brown, he states, "a project to which the United States and Canada are committed by international treaty."

Now, do I understand your response to Mr. Boehlert's questions to indicate that the series of agreements among the various parties here do have or do not have the legal status of a treaty?

Dr. BORIGHT. Mr. Congressman, the title is "Agreement Among the Governments of" and so on. I am advised that, strictly speaking, that can be described as a treaty commitment, but as I said before, the agreement does have clauses relating to the availability of funds and to withdrawal, and so I don't believe that you had any witness here claiming that in some sense there's a legal predetermination of the important choice that you have to make.

Mr. RHODES. Well, if for some reason—and I hope that that reason does not surface—if this action of the Appropriations Subcommittee were to actually take effect and Freedom were cancelled, can you tell us the relative seriousness of our unilaterally breaking the series of agreements as opposed to, for example, our unilaterally abrogating a treaty, violating GATT, violating an arms control treaty, or some other true treaty-type arrangement?

Dr. BORIGHT. I think that all three of the Administration witnesses today have been trying to convey the extreme gravity in terms of American interests—I wish Mr. Valentine were perhaps still here—in terms of American interests in pursuing and fulfilling this commitment that we have, but, again, let me say no one has said that this agreement does not have provisions relating to the availability of funds, and I must say that taking this action would certainly not be in the same category as abrogating an arms control agreement beyond whatever withdrawal clauses there were in that agreement.

Mr. RHODES. Thank you.

Thanks, Mr. Chairman.

The CHAIRMAN. And for the remaining minute or two, Mr. Hall of Texas, the distinguished Chairman of the Space Subcommittee.

Mr. HALL. Thank you, Mr. Chairman.

Let me start out by saying that I'm not among those who want to bash Japan. I have high regard for the Japanese. Once they're sold on a program, they're excellent partners, and I'm from an agriculture State. They're the world's leader in the purchase of agricultural products from this country, so nothing I say is intended to indicate that I have anything other than admiration for them.

But I also have admiration for Mr. Boehlert, and knowing of his value to the support of a project, I continue to appeal to him to reconsider some of his positions on other science matters that are not discussed here today. But like other New Yorkers and another very famous New Yorker back in 1943 or 1944—1942 maybe—Mr. Roosevelt, who was the President at that time, sometimes New Yorkers are prone to need to be talked to in parables.

[Laughter.]

Mr. HALL. And one, Mr. Chairman, if I might just use a minute or so of my time, is of Cordell Hull—

The CHAIRMAN. We make exceptions for parables.

[Laughter.]

Mr. HALL. Cordell Hull and Henry Stimpson kept telling Mr. Roosevelt that they had a way to split the atom and hasten the end of the war, but Mr. Roosevelt kept saying that "We're taking island-to-island, we're doing okay, and I don't want to hear about that Buck Rogers stuff." But they called him one morning and said, "We want to come over and eat breakfast with you." This is supposedly a true story. Most of my stories are true stories.

[Laughter.]

Mr. HALL. And they told him the story about a young American that stood outside Napoleon's gates for three winters trying to get in to talk to him to tell him that they had a way for him to invade England. Finally, Napoleon sent word out that said, "Tell that

American to go on back to his own country, or I'll put him in irons," and Robert Fulton came back to this country and gave us the steamship. Mr. Roosevelt is supposed to have said, "That's fine. Show the scientist in. I'll see them," and that's the way the Manhattan Project got under way.

Maybe there's a parable here in the fear, and I mean no pun by this, but Russia has a space station, Japan has the yen for a space station.

[Laughter.]

U.S. STANDING IN CIVIL SPACE RELATIVE TO OTHER NATIONS

Mr. HALL. Do you see a danger there in that combination? We are losing—at least, our automotive market is atrophying away, basically to the Japanese, somewhat to the Germans, and we don't know what a unified Germany will do to the automotive market. We've always feared that when you look skyward that the Japanese might take that market over. And if you look through the sky and on into space, and they should link up or hook up with the Russians, who already have a station where they can pursue medical decisions and find a cure for cancer and diabetes and other dreaded diseases, where would this country be if we had the little sense to stop the program that's going to eventually build us a space station and complete our pursuit of space? Where would this country be, Admiral?

Adm. TRULY. Well, I would certainly restrict my remarks, I think, to the general rather than the specific other nations of the many nations that could form the future partnerships that you said, but I think it would be terribly detrimental to our national security in its broadest terms if we walk away from the Space Station and therefore, I think, take a walk away from the Civil Space Program. Other nations are going to fill that gap. They are going to fill that gap with partnerships, and those partnerships are not likely to be in the next few years with us, and I think that of the many industries where we compare our status with those of other nations that this would signal that we would actually by vote — by vote—walk away from a leadership position that we clearly have today in the space business.

Mr. HALL. I think in closing the major request I have is that you let the word go forth and that the Vice President, who heads up the space pursuit, and the President of the United States, who has access to the press, that they let the word go forth to the American people that the Space Station is in danger, and I firmly believe that the American people will respond.

I yield back my time, Mr. Chairman.

The CHAIRMAN. Thank you very much, Mr. Hall. I just wish you hadn't suggested that the Japanese join up with the Russians. They're liable to take you up on it.

Thank you very much, Admiral Truly and Dr. Boright. Your testimony has been extremely valuable. I apologize to those members who didn't get an opportunity to question you, but they will be recognized first in questioning the next witnesses. You're excused at this point.

Adm. TRULY. Thank you, Mr. Chairman.

The CHAIRMAN. Let me welcome Mr. Jean-Marie Luton, Director General of the European Space Agency, to the table and Dr. Kenji Funakawa, Executive Vice President of the National Space Development Agency of Japan, and they will be accompanied by appropriate aides.

May I say that it's always an honor as well as a pleasure to have distinguished foreign visitors before our committee. It is a practice longstanding that, because space and science are international activities, that we solicit the views of eminent representatives of other countries, so this is not a new occasion for us, but it's always a delight to have you, even though you may bring messages that we're not all that happy to hear. We think we need to hear them, and we appreciate your being here.

Mr. Luton, we'll recognize you first, and you may proceed with your statement, and then Dr. Funakawa.

STATEMENT OF JEAN-MARIE LUTON, DIRECTOR GENERAL, EUROPEAN SPACE AGENCY

Mr. LUTON. Mr. Chairman, I should like first to ask you if it is possible to make a preliminary intervention before my own testimony.

The CHAIRMAN. Certainly.

Mr. LUTON. Mr. Chairman, yesterday night we met, the European Space Agency, NASDA, and the Canadian Space Agency, which are all three partners of NASA in the Space Station Freedom, and after discussing the situation, we have issued a communique about this situation, and I should like on the behalf of the three partners to ask you to put in the full hearings the communique.

The CHAIRMAN. Without objection, the full text of the Joint Communique by NASA's Space Station Partners will appear in the record at this point.

[The joint communique follows:]

Canadian Space Agency
Agence spatiale canadienne

esa
european space agency
agence spatiale européenne

NASDA
宇宙開発事業団

Joint Communique by NASA's Space Station Partners

NASA's three partners in the International Space Station Freedom Program - the Canadian Space Agency (CSA), the European Space Agency (ESA) and Japan's National Space Development Agency (NASDA) - met today to discuss their profound concern over recent action by the United States House of Representatives' Appropriations Subcommittee for Veterans' Affairs, Housing and Urban Development and Independent Agencies that could result in the withdrawal of the United States from the International Space Station Freedom Program, effectively terminating it.

The President of CSA, the Director General of ESA and the Executive Vice President of NASDA held a special meeting at the Canadian Embassy, convened on short notice to discuss their concern over the future of the Space Station Program.

The meeting, the first of its kind since the thirteen participating nations* began the design and development of Space Station Freedom elements over three years ago, confirmed that the United States' partners remain fully committed to developing and operating Space Station Freedom in cooperation with the U.S.A. as set out by the duly signed Intergovernmental Agreement.

The agency heads recalled that in response to the invitation from the President of the United States in 1984 to participate in the program, all partners had reoriented their priorities to make the Space Station a central element of their respective space programs. It was further noted that all partners have invested substantially in the program, in good faith, and that over a quarter of the development work has been completed. The agency heads were unanimous in expressing their disbelief that the U.S.A. would now consider withdrawing from such an important international venture thereby effectively terminating the program.

"The significance of the Space Station Program lies not only in its goal to further humanity's exploration and peaceful exploitation of space," stated the agency heads. "It is also a test of the ability of the participating nations to concert their efforts towards a common goal. The withdrawal of the United States of America from this program would have far reaching implications for the future of international cooperation in space".

The non U.S.A. partner agency heads concluded their meeting by registering their satisfaction with the determination of President Bush and Vice President Quayle to have full funding restored for the Space Station Freedom Program and then met collectively with NASA's Admiral Truly to convey their continued support. The agency heads jointly called upon Congress to work towards providing the long term stable funding essential for the implementation of a complex, long duration program such as Space Station. The agency heads urge the United States of America to fulfill its commitment and obligations to complete this, the largest international science and engineering project ever undertaken.

Issued June 3, 1991 in Washington D.C. by:

Larkin Kerwin

Dr. Larkin Kerwin
President,
Canadian Space Agency

Dr. Jean-Marie Luton
Director General,
European Space Agency

Kenji Funakawa

Dr. K. Funakawa
Executive Vice
President,
National Space
Development
Agency of Japan

* Participating Nations

Belgium, Canada, Denmark, France, Germany, Italy, Japan,
the Netherlands, Norway, Spain, Sweden, the United Kingdom,
the United States of America.

Mr. LUTON. Thank you, Mr. Chairman.

Mr. Chairman, I would like to start by saying that today's hearing is timely in light of the Congressional action that has been taken to terminate the international Space Station cooperation. While it is regrettable that such a hearing should prove necessary at this stage of the program, I appreciate the opportunity to express Europe's views on the matter directly to Congressional representatives.

I do not intend, of course, to comment on how current budget priorities in the United States should be arranged, but I shall be referring to the commitments the United States Government has entered into with the governments and agency I represent, because these imply the need for adequate Space Station funding to be maintained in your budget process.

Mr. Chairman, when I last visited Congress on 30 January 1990 as a representative of France, it was in the company of my predecessor, Professor Luest, and high-ranking representatives of Germany, Italy, and Japan. We also felt it necessary then to make plain our view that the action taken by NASA, in response to budgetary constraints, to alter unilaterally plans relating to the international Space Station should not have occurred without full consultation with its partners and respect for their interests. Canada, the remaining partner, expressed the same sentiments by letter.

So, indeed, did your predecessor, Mr. Chairman, the Honorable Robert Roe, when he remarked, "It is a waste of valuable resources and highly unfair to our international partners to continue to play budgetary games with this program."

Since them, matters have improved considerably. The rephasing and restructuring exercises, long and energy- consuming though they were, did see NASA involving its partners throughout, with burdensome results, but ones finally acceptable to all concerned. The scale of the restructuring exercise merits special mention in this regard, since the origin of that exercise was Congress itself, whose fiscal and other guidelines were met.

At the end of the restructuring process, we thus had at last reached, we thought, the prerequisite for a successful venture: a well-costed, technically sound program. It was our understanding that the Congress, having sought and found a valuable fiscal framework, subsequently accepted the results of the process NASA had undertaken with its international partners to accommodate the constraints of that framework.

The "Scrub 1989" exercise already led to deep concern regarding the fair execution of the program in line with the principles of the 1988 Space Station Accords. The reaction of Europe to the news that plans are afoot within the legislative branch of the United States Government to discontinue the program altogether is one of serious alarm and dismay.

I have so far expressed Europe's views regarding this development in letters to Vice President Quayle in his capacity as the Chairman of the National Space Council, Secretary of State Baker, and Administrator Truly, copies of which are attached to my statement. I am pleased to note that I have received strong assurances of the Administration's continuing commitment to the program.

Against this background, let me inform you on how Europe now sees U.S. actions in this cooperation. The United States first makes a conscious decision to go ahead with a project of this magnitude. The President of the United States then invites friends and allies to participate in the project. These friends and allies then enter into international agreements with the United States—the intergovernmental agreement, or IGA, and Memoranda of Understanding—that effectively bind the fate of their nations' long term space programs to that of the project. In Europe's case, entering the cooperation requires reconfiguration of its long term space plan. Yet, after three years of joint development work and seven years after first inviting the other nations to participate in this genuine partnership, the United States suddenly now feels able to stop the project in its tracks to solve an internal budget problem.

We all face budget shortfalls and very hard choices, but there is something profoundly wrong with this kind of situation, and something that requires more than an explanation based on the year-by-year fiscal difficulties.

Turning to what would be the consequence of the Congress' discontinuance of Space Station funding, I would first comment from the point of view of someone accountable to European taxpayers. To date, Europe's contribution to the international Space Station has resulted in the expenditure by ESA's member states of approximately $1 billion in U.S. dollars. Furthermore, Europe is the second largest contributor to the international Space Station and plans to spend over $5 billion in U.S. dollars to implement its space station program, Columbus. Of course, entering the international Space Station project also represented a significant political commitment on Europe's part—first, to permanent manned use of space, and second, to international cooperation. Thus, even the financial and programmatic consequences of the U.S. withdrawal, vital though they are, would finally not be the most important over the longer term.

Our estimation of the technological, scientific, and long term commercial benefits of space station work remains intact. Our opinion of the utilization potential of Freedom's manned base in particular remains high. Failure by the United States to live up to its commitments in the international Space Station partnership will fundamentally influence Europe's plans, but not stop the pursuit of its own ambitions to implement manned/man-tended orbital facilities. The effect of a unilateral decision by the U.S. to abandon the Space Station would be to compel Europe to change its present manned program, to modify its implementation, and to review international cooperation.

Moreover, it cannot be doubted that U.S. withdrawal from the international Space Station would have a serious adverse impact on the prospects for any future transatlantic cooperation in the space field. It would certainly have an effect in other scientific and technological fields. These effects would, of course, be felt most should the United States attempt to initiate a major new international technological program.

The above having been said, I must stress that Europe's desire to continue with the international Space Station Program in partnership with the United States, Japan, and Canada is as strong as ever.

A meeting of Europe's space ministers in the European Space Agency Council this November, which will be making the necessary adjustments to the European long term space plan in light of the last three years' experience, will be reviewing the outcome of the process which we are today addressing. Even considering all that has happened, I very much hope that I shall be able to report at that meeting a fresh and lasting commitment by the Congress of the United States to the international Space Station Freedom.

With this in mind, I would urge you to work toward some form of multi-year funding commitment in the U.S. for this program, as it will be crucial to program stability and to raising the level of your partners' confidence. The future of this cooperation is clearly in your hands.

Mr. Chairman, I have spoken my mind and Europe's mind without masking the sense of what I had to say in diplomatic niceties. I know, Mr. Chairman, that you and your colleagues will interpret my remarks in the spirit of the fine tradition of cooperation which Europe and the United States have enjoyed for over a generation in this field. I would like to thank you and your colleagues for hearing my views today and would be prepared to entertain questions at the appropriate time.

[The prepared statement of Mr. Luton follows:]

STATEMENT

BY

JEAN-MARIE LUTON
DIRECTOR GENERAL OF THE EUROPEAN SPACE AGENCY (ESA)

TO

THE SCIENCE, SPACE, AND TECHNOLOGY COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

4 JUNE 1991

Mr. Chairman, I would like to start by saying that today's hearing is timely in light of the Congressional action that has been taken to terminate the international Space Station cooperation. While it is regrettable that such a hearing should prove necessary at this stage in the programme, I appreciate the opportunity to express Europe's views on the matter directly to Congressional representatives.

I do not intend, of course, to comment on how current budget priorities in the United States should be arranged, but I shall be referring to the commitments the United States Government has entered into with the Governments and Agency I represent, because these imply the need for adequate space station funding to be maintained in your budget process.

Mr. Chairman, when I last visited Congress on 30 January 1990, it was in the company of my predecessor Professor Luest and high-ranking representatives of Germany, Italy and Japan. We all felt it necessary then to make plain our view that the action taken by NASA, in response to budgetary constraints, to alter unilaterally plans relating to the international Space Station should not have occurred without full consultation with its Partners and respect for their interests. Canada, the remaining Partner, expressed the same sentiments by letter.

So, indeed, did your predecessor, Mr. Chairman, the Honorable Robert Roe, when he remarked that "[i]t is a waste of valuable resources and highly unfair to our international partners to continue to play budgetary games with this program".

Since then, matters have improved considerably. The "rephasing" and "restructuring" exercises, long and energy-consuming though they were, did see NASA involving its partners throughout, with burdensome results, but ones finally acceptable to all concerned. The scale of the restructuring exercise merits special mention in this regard, since the origin of that exercise was Congress itself, whose fiscal and other guidelines were met.

At the end of the restructuring process, we thus had at last reached, we thought, the prerequisite for a successful venture -- a well-costed, technically sound programme. It was our understanding that the Congress, having sought and found a viable fiscal framework, subsequently accepted the results of the process NASA had undertaken with its international partners to accommodate the constraints of that framework.

The "Scrub '89" exercise already led to deep concern regarding the fair execution of the programme in line with the principles of the 1988 Space Station Accords. The reaction of Europe to the news that plans are afoot within the Legislative Branch of the United States Government to discontinue the programme altogether is one of serious alarm and dismay.

I have so far expressed Europe's views regarding this development in letters to Vice-President Quayle in his capacity as Chairman of the National Space Council, Secretary of State Baker and Administrator Truly, copies of which are attached to my statement. I am pleased to note that I have received strong assurances of the Administration's continuing commitment to the programme.

Against this background let me inform you on how Europe now sees US actions in this cooperation:

The United States first takes a conscious decision to go ahead with a project of this magnitude. The President of the United States then invites "friends and allies" to participate in the project. These friends and allies then enter into international agreements with the United States (the Intergovernmental Agreement, or IGA, and Memoranda of Understanding) that effectively bind the fate of their nations' long-term space programmmes to that of the project; in Europe's case entering the cooperation required reconfiguration of its Long Term Space Plan. Yet, after three years of joint development work and seven years after first inviting the other nations to participate in this "genuine partnership", the United States suddenly now feels able to stop the project in its tracks for purely internal convenience.

There is something profoundly wrong with this kind of situation, and something that requires more than an explanation based on year-by-year fiscal difficulties.

Turning to what would be the consequences of Congress' discontinuance of space station funding, I would first comment from the point of view of someone accountable to European taxpayers. To date Europe's contribution to the International Space Station has resulted in the expenditure by ESA's Member States, of approximately one Billion US Dollars. Furthermore, Europe is the second largest contributor to the international Space Station, and plans to spend over five Billion US Dollars to implement its Space Station programme, Columbus. Of course, entering the international Space Station project also represented a significant political commitment on Europe's part, first to permanent manned use of space and, second, to international cooperation.

Thus, even the financial and programmatic consequences of US withdrawal, vital though they are, would finally not be the most important over the longer term.

Our estimation of the technological, scientific and long-term commercial benefits of space station work remains intact. Our opinion of the utilisation potential of Freedom's manned base in particular, remains high.

Failure by the United States to live up to its commitments in the international Space Station partnership will fundamentally influence Europe's plans, but not stop the pursuit of its own ambitions to implement manned/man-tended orbital facilities. The effect of a unilateral decision by the US to abandon the Space Station would be to compel Europe to change its present manned programme, to modify its impelementation and to review international cooperation.

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esa
european space agency
agence spatiale européenne

DIRECTOR GENERAL OF ESA

JEAN-MARIE LUTON was born 4 August 1942 at Chamalieres (Puy-de-Dome).

After graduating form the "Ecole Polytechnique", he carried out research in the field of external geophysics at the Service d'Aeronomie of the CNRS, from 1964 to 1971, when he was appointed "Chargé de Recherches" at the CNRS.

From 1971 to 1973, he acted as "Chargé de Mission" at the "Service des Programmes des Organismes de Recherche" (SEPOR) within the Ministry for Industrial and Scientific Development. In this capacity, he was involved in drawing up the French position on space policy and in the European negotiations which led to the setting up of the European Space Agency (ESA) and the adoption of the Agency's programmes.

In 1974, he joined CNES where, within the Programmes and Industrial Policy Directorate, he was successively Head of the Research Programmes Division, from 1974 to 1975, then from 1975 to 1978, Head of the Planning and Projections Division.

In 1978, he was appointed Director of Programmes and Planning, a post he held until February 1984, when he became Deputy Director General.

In May 1987, he joined the AEROSPATIALE Company as Director for Space Programmes within the Strategic and Space Systems Division.

From February 1989 to September 1990, he was Director General of CNES, the French Space Agency.

In October 1990 he became Director General of the European Space Agency (ESA).

Member of the International Academy of Astronautic (I.A.A.)

Jean-Marie Luton is "Officer de l'Ordre National de Merite".

He was awarded the Astronautics Prize of the French Association for Aeronautics and Astronautics (A.A.A.F.) in 1985.

955 L'Enfant Plaza, S.W., Suite 7800, Washington, D.C. 20024 Tel. (202) 488-4158 — Fax (202) 488 4930

The CHAIRMAN. Thank you very much, Mr. Luton. We will indeed accept your remarks in the spirit of cooperation which has existed between the United States and the countries of Europe, and as you know, the large majority of us on this committee very much appreciate the position that you're taking, and we believe that a thorough understanding by the Congress of the importance of this issue to our European partners may be the most important factor in reversing the position that's been taken here.

Let me now recognize Dr. Kenji Funakawa, who is Executive Vice President of the National Space Development Agency of Japan, for his statement, and when he completes his statement, we will have questions from the committee to both of you.

Dr. Funakawa?

STATEMENT OF DR. KENJI FUNAKAWA, EXECUTIVE VICE PRESIDENT, NATIONAL SPACE DEVELOPMENT AGENCY OF JAPAN

[Statement delivered through translator.]

Dr. FUNAKAWA. Mr. Chairman and distinguished members of the committee, it is a great honor for me to appear before this committee to explain to it the view of the National Space Development Agency—NASDA—of Japan with regard to the Space Station Program, which Japan is taking part in.

NASDA was established by law as an independent agency in charge of implementation of the Japanese space development. In accordance with the Memorandum of Understanding—MOU— between the Japanese government and NASA, concluded under the intergovernmental agreement on space station cooperation, NASDA, as appropriate, assists Science and Technology Agency of Japan in the implementation of the Space Station Program.

In this statement, I would like to address the importance of the Space Station Program to Japan first, and then proceed to the current status of the Japanese program which is a part of the Space Station Program; Japan's attitude toward the restructuring activities of the Space Station Program conducted from October 1990 to January 1991; our recent concerns for and possible impacts of NASA's budget deliberation; and lastly, our requests to the United States Congress.

We believe that the Space Station Program will greatly contribute to research and development in the field of life science and microgravity science through the utilization of the space environment. We also believe that the Space Station Program will provide significant opportunities to investigate unknown potentials in space, to acquire new knowledge and thought, and to advance science and technology.

As all of you are well aware, the Space Station Program is an international collaborative project between the United States, which invited friends and allies to participate in this project, and Japan, the ESA member states, and Canada, all of which accepted this American invitation. Against this background, this program is given one of the highest priorities in Japan's fundamental policy for space development.

The Japanese government, having secured the Diet approval, deposited an instrument of acceptance of the IGA with the United

States Government in September 1989 and fulfilled the procedures necessary for the entry into force of the MOU. Japan has already started the development of the Space Station.

As stipulated in the IGA, each state has a respective obligation to provide specific parts of the Space Station. It is Japan's obligation to provide the Japanese Experiment Module—JEM—for this project. JEM is now being successfully developed by NASDA. NASDA has even reformed its organizational structure in order to effectively conduct necessary development activities. It has entered into contracts worth approximately one-fourth of the total development cost.

NASDA has hoped that NASA's program would remain unchanged after the rephasing in the year before last. Nevertheless, when the U.S. Congress requested the restructuring of the Space Station last year, Japan again extended its maximum cooperation as one of the international partners in order to ensure smooth implementation of this program, having taken into consideration both U.S. Congressional concerns and the importance of the international Space Station Program. Consequently, we were convinced that the restructuring program that we had worked out with efforts for months would get support of the U.S. Congress because it succeeded, in our view, in meeting all of the requirements of the U.S. Congress.

I am very surprised, therefore, to learn that the VA, HUD, and Independent Agencies Subcommittee of the Appropriations Committee of the House voted down the Space Station Program budget for fiscal year 1992, and I must express our great concern about the impact of this decision on the future of the program.

As I have said, Japan has made its best efforts to fulfill its responsibilities to contribute to the Space Station Program since we accepted the U.S. invitation to the program. Therefore, if the program were to be cancelled, our tremendous efforts in reforming the organizational structure, securing contractors, taking part in international restructuring activities, and securing support of the Diet and the government would be all in vain. This would not only have a great negative impact on the Japanese Space Development Program, but would make it difficult for Japan to proceed in the future with international cooperative programs with the United States in the field of space activities.

We also cannot ignore impacts on international credibility. NASDA has established extremely good relations with NASA, ESA, and CSA based on a spirit of mutual confidence and cooperation through the implementation of our joint projects in the past.

Should it be unavoidable for NASA to terminate the Space Station Program because of the budget cut by the Congress, this joint project would have to be given up, although it has been promoted for years by 12 countries, each of which has been fulfilling its respective assignment in accordance with the IGA. This in turn could greatly damage the trust and confidence which the United States enjoys in Japan in the field of space cooperation. I fear that the same feelings could prevail in the minds of other participating countries.

Successful space development heavily relies on international cooperation, and we believe that it is a basic policy of the U.S. as well as of Japan to promote cooperation in this field, as is mentioned in the fundamental policy of Japan's space development and the Augustine report. Should we have to give up the Space Station Program, we would face severe difficulties in planning our future international cooperation in space, and the hope held by the people of Japan and the United States for future space development would suffer a great setback.

Therefore, we sincerely hope that the U.S. Congress would extend favorable consideration in rendering financial support to the U.S. portion of the Space Station Program. We also hope that the U.S. Congress would act and ensure that the Space Station Program should be implemented in accordance with the IGA.

In concluding my statement, I would like to express our heartfelt desire to maintain our long term cooperative relationship with NASA and the other international partners. I sincerely hope that you fully understand the extent of our endeavor, our concerns, and requests which I have explained.

Thank you, Mr. Chairman and distinguished members.

[The prepared statement of Dr. Funakawa follows:]

Statement of Dr. Kenji Funakawa
Executive Vice-President
National Space Development Agency of Japan
before the
Committee on Science, Space and Technology
the U.S. House of Representatives

4 June 1991

Mr. Chairman and distinguished Members of the Committee:

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Thank you, Mr. Chairman and distinguished Members.

PERSONAL HISTORY

1. Name: Dr. Kenji FUNAKAWA

2. Date of birth: June 15, 1925

3. Place of birth: Kyoto-city, Japan

4. Nationality: Japan

5. Present address: Bessyo-cho 1-32, Ohmiya-city
   Saitama Pref.

6. Present Profession: Executive Vice-President
   National Space Development Agency
   of Japan

7. Education: B. Sc. in engineering, Tokyo University, 1947
   Dr. Degree in engineering, 1969

8. Professional experience

   1947, Japan Radio Corp.

   1950, Radio Regulatory Bureau, Ministry of Posts and Tele-communications

   1958, Radio Research Lab., Ministry of Posts and Tele-communications

   1976, Director, Tracking and Data Acquisition Dept. National Space Development Agency of Japan

   1983, Executive Director, NASDA

   1989, Executive Vice-President

The CHAIRMAN. Thank you very much, Dr. Funakawa. We do very much appreciate both the content and the spirit of your presentation, and we share the concerns which you have raised.

Let me now recognize our distinguished member from Tennessee, Marilyn Lloyd, who is the Chairman of our very important Energy Subcommittee.

INTERNATIONAL ATTITUDE TOWARDS FUTURE JOINT PROJECTS

Mrs. LLOYD. Thank you very much, Mr. Chairman. I do appreciate you calling this very critical and very important hearing, and, to our witnesses, we thank you for being with us and your excellent testimony.

I think if we should continue in this direction to kill the Space Station, I think it would be a dismal indictment on our country. If we fail to meet our commitment to this very vital research and development program, I think that as a Nation we would be eating our seed corn. Do you understand? I feel it's an investment in the future of our country.

I think it's very essential also that we continue our commitment to international participation in science and technology. It's important to the economy of our world. I think it's important that we recognize the impact that a cancellation would have on our young scientists and engineers and even those that are contemplating careers in the aerospace field.

Mr. Chairman, I really don't have a parochial interest in the Space Program, but I would like to say that I have sort of a parental interest. My little granddaughter went over to Huntsville with her little Brownie Scout troop a couple of weeks ago to look at the Space Program, and she came back very excited about what the future holds for her generation to reach out for new thoughts and ideas, and I would say that we have a responsibility to this generation as well as to other generations of Americans.

So my question to you distinguished members of the space program of your nations is how would cancellation of the Space Station affect the prospects for international participation on future large-scale science and technology projects for the United States? As the Chairman said, I'm Chair of the Energy Subcommittee, and we have a lot of very important work, international cooperations, not necessarily in your field, but such as the International Fusion Energy Program. I would certainly hate to see a cancellation have a devastating impact on other very important scientific experiments.

Mr. Luton, then Dr. Funakawa.

Mr. LUTON. I want first to remind you that I am the Chief of Executive inside of an organization which represents 13 countries, and we make integration of space afoot inside Europe. So the question on which you have asked is not yet completely debated inside Europe, but I could not be the Director General of such an organization if I can't anticipate what will be the reaction in the future of the member states.

First of all, I must make first testimony which is clear. If you cancel the Freedom Space Station, how do you want that you have any answer about the next big project, which is exploration activities? Impossible to understand how you don't fulfill the first stage before to get an agreement on the second one.

Mrs. LLOYD. The prospects would be pretty grim.

Mr. LUTON. Clearly in space. If I take the overall situation inside Europe—I speak personally, but I have said in the mind that I can understand—I must imagine that we would be a very strong coalition between the unacceptability of taking new big, long term risk in cooperation, in big project, and the lack of confidence generated by the cancellation of Space Station programs. It is clear that Europe may accept to begin a discretion of any project with the ghost of Freedom Space Station in mind, the conditions would be very heavy to get an agreement. Very heavy in terms of guarantee, in terms of hold, in terms of how Europe can be sure to go on, even if the United States does not go on in this new project. This will be a real ghost inside all European memory.

Mrs. LLOYD. Dr. Funakawa?

Dr. FUNAKAWA. Well, as I mentioned in my statement, at least in the area of space, the future international cooperative program will face enormous difficulty if this program is to be cancelled, and that's something that we can easily predict. However, in the other area other than space, in the general area of science and technology, since I am a member of NASDA, I'm not in a position of responding to that question directly when it comes to overall science and technology questions, but I can tell you that success of this Space Station project will be a very important key to the future of joint projects in the science and technology area.

Mrs. LLOYD. Thank you very much, Mr. Chairman.

The CHAIRMAN. I'd like to recognize Mr. Sensenbrenner, who did not get an opportunity to interrogate the witnesses earlier.

CANCELLATION COSTS FOR EUROPE

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman.

I'd like to extend my welcome to our distinguished visitors here. We need your help, and thanks for coming.

Mr. Luton, you testified that the member states of ESA have already spent $1 billion in U.S. dollars to fulfill their part of what was agreed to in the Space Station. If the Congress should cancel the station, how much additional money would ESA have to spend in order to get out of the contracts that have already been signed, but for which there has been no payment made?

Mr. LUTON. Mr. Chairman, first of all, we have not spent the five years—the seven years that I spoke in my testimony to anticipate each year a change of scenario. So it is clear that we have not put on the table and we have not made any studies to make an estimation of the cost that you asked to me. We worked on one scenario, which was the Space Station Freedom scenario going in orbit, and the international cooperation working with, but I must tell you that we will do the estimation, but I have said we don't—I can't anticipate that Europe will go everything's done. In Europe, we have made participation in the Freedom Space Station, and at the same time we are progressing to have man-tended infrastructure. So it is clear that such a situation would give us more versatility to be strictly autonomous.

Mr. SENSENBRENNER. Do you have any idea of what kind of a bill you would get from your contractors if we lose this battle and you have to call them up and say that "All those contracts we signed with you are off?" How much would they ask of you or how much would they sue you for in court?

Dr. ENGSTROM. As you noted from Mr. Luton's answer, he does not even imagine that you will close down the contracts. We would rather reorient the program. But what the cancellation charges would be would be in the order of a couple hundred million dollars if we close it down.

INTERNATIONAL PLANS TO CONTINUE STATION DEVELOPMENT WITHOUT U.S.

Mr. SENSENBRENNER. Dr. Engstrom, by your saying that you're going to reorient the program, are you telling us that Europe will seriously consider putting up their own space station if the United States does not decide to play the lead role in it?

Dr. ENGSTROM. Yes, I think that the exact implementation of such plans is the point that Mr. Luton was making, that we are not now studying the alternatives, but as was stated in his statement, Europe will not be stopped in its pursuit of manned space capability. Now, the form that that takes to implement that will have to be different, and we don't want to speculate on this now, because, as we said, it fundamentally changes the scenario. We have one scenario, we have lived with it for about seven years, we have reoriented our programs according to that. If a totally new situation comes up, which this would be, we would have to rethink, but nobody, I think, is hesitating today about the will to go on. We'd just have to regroup.

Mr. SENSENBRENNER. Thank you.

Dr. Funakawa, let me ask you the same type of questions. How much has Japan actually expended to date, and how much would it cost to cancel the contracts that NASDA has entered into with its contractors?

Dr. FUNAKAWA. Well, as I mentioned in my statement, NASDA—Japan—has already started manufacturing of the Japanese Experiment Module—JEM—and the total development cost is estimated at $2.25 billion. It has already entered into contract with one-fourth of that total development cost.

To answer the second part of your question, if the Space Station is cancelled how much we have to pay, well, we never thought about possible cancellation, so we have not done any specific study concerning the possible cost for that, so I cannot tell you an exact amount at this point, but it is clear for us that we have to review the overall project, including the JEM program. However, under the JEM contract, we are supposed to pay whatever expenses that subcontractors will spend up to the point of the cancellation date, so that much money, at least, we have to pay to the contractors at the time of cancellation, and also we expect that we may be sued by our subcontractors, and how much damage we need to pay, we are not sure. At this moment, we have not calculated it.

Mr. SENSENBRENNER. Well, let me make the observation that between the billion that ESA has already spent and the $200 million cancellation charges, the $650 million that Japan has already spent and cancellation charges that are yet to be liquidated, plus the Canadian cost, that if the Congress should decide to defund the Space Station, I think the Congress is effectively stiffing our allies between $2.25 billion and $2.5 billion in U.S. dollars. That is a rather large amount of money and is going to have severe international consequences, not only in terms of scientific cooperation, but also in terms of the foreign policy of the United States in other areas.

I think that the Congress has got to think long and hard before pulling the rug out from underneath our international partners through the defunding of the Space Station and sending them a bill of somewhere between $2 billion and $2.5 billion. That is something that ought to cause us long and hard thoughts before we go ahead and do what the subcommittee expected us to do.

So I think that it's quite plain that there are significant international consequences to the decision that HUD made and that the Congress cannot make this decision in a vacuum, particularly due to the huge cost that the international partners have already incurred and will incur in reliance upon the agreements that were made at the time this Congress itself authorized to go ahead with the Space Station.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, Mr. Sensenbrenner. I'm glad you emphasized those points.

Mr. Kopetski?

Mr. KOPETSKI. Thank you, Mr. Chairman. I certainly applaud your leadership in this issue. I think that after a very difficult few days we will be successful in our mission to save the Space Station.

I certainly want to join in welcoming our distinguished guests and our space partners to the United States and to the Congress. By way of explanation and certainly not an apology, you're getting to see the American political system, democracy, at work. Sometimes it has bumps in the road, but we have a full, open process here that we appreciate always.

I am from a State out west, Oregon, which does not benefit from the Federal spending on the Space Program, so I don't have any parochial interests, as my good colleague and friend from Tennessee described it, in terms of my own district or even my State, but I am supportive of the Space Station for a number of reasons, going back to my youth when President Kennedy urged us all to reach out to the new frontiers of space, and that's what we've done in the past 30 years as a nation.

But also because I have one of the greatest engineering schools in the world at Oregon State University, where for years too many of the graduates from this school take their talents and put it into the defense industry and put their talents into making weapons of destruction, and I want to see them put their talents into a mission of peace, a joint mission of peace for the world, and so I think that we're going to benefit as a society here, in my district and in my country and all of our countries, if we continue down the path that we've started.

I don't have a question for Dr. Funakawa, but I do have a question for Mr. Luton. On page 3 of your testimony, I'm curious as to what your next line may be in the second paragraph, the first full paragraph, where you state that "There is something profoundly wrong with this kind of situation, and something that requires more than an explanation based on year-by-year fiscal difficulties." I'm curious if you think that there may be some other subtle reason that's going on in the Congress here rather than something other than fiscal in this decision.

The CHAIRMAN. We're awaiting your answer with great interest, Mr. Luton.

[Laughter.]

Mr. LUTON. Mr. Chairman, you must understand that Europe itself, inside the cooperation between member states and others, has a long tradition of such situations of failing to make material commitment. We have a political commitment. And it was in my statement of one year ago that you have the spirit and you have the law, and until now, I have always observed in our projects that the spirit is above the strict law.

Often you can find that you can have inside some country the law of year-by-year basis funding, but when this country decided to enter in an international agreement, it used to have some higher retained term of budgetary in order to make safe the commitment between the partners. In such case, I think we don't speak about just a question of legal situation of agreements more than to understand there is a will to kill the Space Station or not. That is the question in my testimony.

Mr. KOPETSKI. I see.

I think that in my discussions, Mr. Chairman, with my colleagues—and I'm out there trying to get some votes in support of the Space Station—that there is a genuine concern about our budget situation and some of our own domestic needs. There are those, no doubt about it, who disagree with the policy itself, but there are a block of individuals who would gladly support full funding of the Space Station if we were awash in taxpayers' money, but we're not.

And so I have a better understanding now, and I appreciate your comments very much. But please understand that there are some members who want the Space Station but feel constrained by the domestic needs of our Nation as well, and that is what's making this a very difficult vote for them.

Thank you, Mr. Chairman. I yield back my time.

The CHAIRMAN. I'd like to give you a much more extended discussion of why we are in this problem, but I'm going to spare you that this morning.

Mr. Hall?

Mr. HALL. Mr. Chairman and members, I've looked at the personal history of Dr. Funakawa and of Mr. Luton and am impressed by it. Obviously, they speak for their country.

Dr. Funakawa is the Executive Vice President of the National Space Development Agency of Japan, which is a very important thrust for your country. I notice Mr. Luton was Director General of the French Space Agency and is Director General of the European Space Agency, so you pretty well speak and know where they come from in this situation, and in reviewing the testimony of both of you, it follows the same pattern.

You've set up that you were invited as friends and allies by the United States to come into the parlor and talk with us and to discuss with us, and Dr. Funakawa goes on and sets up that you had hoped that NASA's program would remain unchanged after it was rephased the year before last. You had said that to change it now would not only have a great negative impact on the Japanese Space Development Program, but would make it difficult for Japan to proceed in the future with international cooperative programs with the United States in the field of space activities, and also you talk about international credibility—Dr. Funakawa does—and it would greatly damage the trust and confidence which the U.S. enjoys in Japan in the field of space cooperation.

Mr. Luton goes along the same line. He sets out the background there on how the U.S. first made a conscious decision to go ahead with the project of this magnitude, and then the President invited you, "Come on into the parlor and let's talk and let's discuss this and let's be friends and let's be partners and let's go down the road together," and you all then entered into an international agreement with the United States that pretty well "binds the fate of both nations," in your words.

You go on to say that the failure of the United States to live up to its commitments in the international Space Station partnership would fundamentally influence Europe's plans, but not stop the pursuit of its own ambitions to implement manned/man-tended orbital facilities. You go on to say the effect of a unilateral decision by this country to abandon the Space Station would be to compel Europe to change its present manned program and to modify its implementation and to review international cooperation. Those are well said and, I'm sure, speak your deepest feelings.

Let me just be practical and ask you some questions here that I think this country needs to hear, and one is you envision proceeding with the development of a manned space station, do you not? Both countries.

Mr. LUTON. Yes.

Mr. HALL. That's the briefest answer we've had all day.

[Laughter.]

Mr. HALL. I'd ask Dr. Funakawa, I think, you don't plan to cancel your space ambitions. You plan to proceed with the development of a manned space station, do you not?

Dr. FUNAKAWA. Well, in Japan, we have a long term space development plan, and under that plan, the only specific activity which is included in that long term plan is to participate in the Space Station Program with the United States, and that's all. There is no other further programs including those manned activities in the long term plan of Japan. However, if the Space Station is cancelled, we may need to, obviously, discuss our future direction internally, and Japan, I believe, is not capable of conducting manned space activities by itself. I anticipate that there may be heated debates on that point.

Mr. HALL. And I take it that each of the entities that you represent intend to go forward and would go forward without the participation of the United States if we don't change the Appropriations Committee's decision?

Mr. **Luton**. I should like to answer yes, but I must be clear: we need to discuss at the political level first what will be the adjustment of our plan in such a situation. But it's clear that we have committed already some piece which permit us to have complete manned activities in the future in Europe, but it's clear, too, that the decision to cancel the Space Station should give us a lot of problems, a lot of modification of our plan, and it is clear that we should like to go on the cooperation that we have already started.

Dr. **Funakawa**. Well, if the Space Station is cancelled, Japan has to start all over again from the preliminary study, and step by step we have to conduct various studies, since I told you before, we never anticipated possible cancellation of the Space Station Program, and it will be very, very difficult for Japan to establish a new program without participation of the United States, and also internally in Japan we need to discuss much more in order to decide whether or not Japan should pursue its own way so that it can conduct space activities by itself or not.[1] There may be so much need of more debate on that point.

Mr. **Hall**. I thank you very much, and I would just give you this assurance: I believe the decision is going to be changed. In this country, we have such a thing called divorce, and you file for a divorce, but then there's 60-day or a 90-day cooling off period. We're going through that period now, and we have a bicameral system and we have a Conference Committee. This all has to navigate that, and I'm sure by that time your input—your very valuable input—is going to reach the American people, and the American people are going to reach the folks up here that represent them, and the six members of the Appropriations Subcommittee that filed the petition for divorce are going to have that cooling off period come back home to haunt them, and I think the Space Station will be saved and we can go on with the international partnership that you so kindly entered into.

Mr. Chairman, I yield back my time.

The **Chairman**. Thank you very much, Mr. Hall.

Mr. Walker, do you have any concluding statement or questions?

EXTENT OF APPROPRIATIONS COMMITTEE CONSULTATION WITH INTERNATIONALS

Mr. **Walker**. Thank you, Mr. Chairman. Just one question, if I might, of the witnesses here.

Did the Appropriations Committee consult with you at all before making the decision to cancel Space Station?

Mr. **Luton**. No.

Dr. **Funakawa**. No consultations whatsoever.

Mr. **Walker**. Well, I find that very fascinating, because we're told over and over again how the Appropriations Committee takes all the concerns into account before they make their decisions and that they hold their hearings and are in many ways superior, we're told, to the Authorization Committee in understanding some of these issues so that they can make fundamental issues. Here's a case where there is obviously a major international concern where the appropriators didn't even bother to ask the people who are going to be directly affected in this partnership before making their determination. That in itself is an appalling part of what the outcome is at this point.

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[1] Letter submitted by Tai Nakamura of NASDA.

At page 119, Dr. Funakawa response to Mr. Hall's question. From line 2713 to line 2723, Dr. Funakawa said that in case of cancellation of the Space Station Japan will face some difficulties to establish new *manned* program. Especially line 2722 Dr. Funakawa mentioned whether Japan should pursue manned space program or not. Actually the line 2722, he mentioned about "manned space activities" instead of general space activities in Japanese. We would like to add the word "manned" between the conduct and space in the line 2722. This line will be "that it can conduct *manned* space activities by itself or not".

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Walker.

Thank you very much, Mr. Luton and Dr. Funakawa. You've been very helpful in presenting your countries' positions to us, and as Mr. Hall indicated, we hope we'll be able to reverse the decision that has been made in the Appropriations Committee. That process will go on for some time, however, so we hope you will follow it closely. That is all the questions that we have for you this morning, and again we thank you for being here.

One concluding item of business. We have a letter from Lieutenant General Thomas P. Stafford, Chairman of the Synthesis Group, indicating that the Synthesis Group supports the Space Station Freedom despite some rumors to the contrary, and without objection, we will include that letter in the record at this point.

[A copy of the letter follows:]

Synthesis Group

June 4, 1991

The Honorable George Brown
Chairman, Committee on Science,
  Space and Technology
2320 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

Your Committee is reviewing the impact of the House Appropriations Committee's decision to terminate Space Station Freedom. Because several news stories have indicated that the Synthesis Group Report does not support Space Station Freedom, I wanted to give you the "real story" prior to release of the Report on June 11.

Space Station Freedom will be an integral element of this Nation's manned space program and the knowledge gained on this research facility concerning long-duration space flight and life sciences is crucial to future missions. The Report endorses Space Station Freedom as the transition to a sustained presence in space and I strongly recommend funding be included for this important program in the FY 1992 budget.

I want to thank you for your interest in our activities. The report is scheduled for release next week and I am anxiously looking forward to discussing its findings and recommendations with you and the members of the Committee.

Sincerely,

Thomas P. Stafford

Thomas P. Stafford
Lieutenant General, USAF (Ret.)
Chairman, Synthesis Group

1225 Jefferson Davis Highway, Suite 1501
Arlington, VA 22202
Phone: 557-5544 · FAX: (703) 557-5502

The **Chairman**. There being no further business—

Mr. **Walker**. Mr. Chairman, I just want to point out that we may want to bring that up very heavily in the debate, because there is some rumor going around that the Synthesis Group does in fact have a report that has been withheld that does not support Space Station, and I think it's extremely important to have on the record that General Stafford denies that.

The **Chairman**. We'll make sure it's on the record.

There being no further business, the committee will stand adjourned.

[Whereupon, at 12:12 p.m., the committee adjourned, to reconvene at the call of the Chair.]

[The biography of Dr. Engstrom, plus the prepared statements of Mr. Costello, Mr. Browder and Mr. Packard follow:]

esa
european space agency
agence spatiale européenne

DIRECTOR OF SPACE STATION AND MICROGRAVITY

DR. FREDRIK ENGSTRÖM

Born in Karlskrona, Sweden in 1939, Dr. Engström studied science at Stockholm University (Master of Science 1964; PhD 1971). He started his career as Project Manager with the Space Technology Group where he was mainly involved in management of launching sounding rockets. From 1965 to 1970 he was respectively, ESRO Fellow at Culham Laboratories (UK) and Research Assistant at the Stockholm Observatory. In 1979 he joined Teleutredningar AB where he was involved in space projects.

In 1972 he became President of the Swedish Space Corporation and also, in 1982, Chairman of the Satimage Corporation.

From 1977 to 1979 Dr. Engström was Chairman of the Remote Sensing Programme Board of the European Space Agency. In 1979, he became a Swedish Delegate to the Council of the European Space Agency.

Dr. Engström has served as ESA's Director of Space Station and Microgravity since 1986.

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OPENING STATEMENT BY U.S. REP. JERRY F. COSTELLO (D-IL)

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

JUNE 4, 1991

SPACE STATION CANCELLATION IMPACT

Mr. Chairman, today we will examine the impact of cancelling the Space Station Freedom Program. It is important that during this hearing we understand what various repercussions this will have on the United States' role in space.

One of the key issues related to the potential cancellation of the Space Station program that could be explored at this hearing is the impact on international cooperation in science and technology. During the last month, relations between the participating countries and space agencies have been strained by the perception that the United States is not adhering to the Intergovernmental Agreement reached by the countries. It is imperative that we resolve this problem and maintain the trust which was the basis for the international agreement.

However, it is also imperative that we not look to restore the cuts by blindly swiping at other important programs such as veterans and housing.

It is of vital importance that the Committee seek diverse opinions when deciding what changes may or may not be needed with our nation's space program. Mr. Chairman, I look forward to hearing from our panel of experts. Thank you for gathering us here to address this subject.

THIS STATIONERY PRINTED ON PAPER MADE OF RECYCLED FIBERS

Statement by Representative Glen Browder
Committee on Science, Space and Technology
Hearing on Impact of the Space Station Cancellation
June 4, 1991

Mr. Chairman, my district is not home to any of the programs directly affected by the proposed cancellation of Space Station Freedom. No jobs are at stake for the people of my district. None of my district's universities will close down research efforts due to the loss of this station. That does not mean that my district will not feel the impact of the cancellation should we permit it to occur.

The claim is made that we cannot do science on the station as it is currently configured. The scientists in my district dispute that claim. My district is home to a research university, Auburn University, which has programs, science programs, that do foresee benefits from the station. Dr. Ray Askew, a physicist and the director of the Commercial Center for the Development of Space at Auburn University, wrote to me about this. Let me repeat his remarks:

> Where do we go from here with our Civil Space Program? The authorization committee worked diligently to stretch the available dollars as far as it could and reduced the President's request by nearly half a billion dollars, but leaving intact a balanced approach to a viable future in space for this nation, an approach which provides for science, technology development, commercial applications, and a space presence to support long duration, man-tended experimentations. During the appropriations process the Space Station was deleted. Certainly there are critical needs within this nation and budgetary restraint is necessary. But how will we deal with our future needs if our scientific and technological foundations are eroded? Can we afford not to sustain a vigorous, aggressive, advanced program in space? We currently maintain some lead in many fields of this area. In others we are on a par with other nations. Can we afford to lose our competitive edge here, as we have done in so many other areas over the last two decades? The loss of our competitive edge eventually means the loss of jobs, with the

resultant loss of tax base to support many of our national needs.

But what does the Space Station have to do with having a viable and competitive space program? Basically, lack of sustained man-tended presence capability in space ensures that much excellent science and technology development will not be done except by other nations which step in to take the lead. Why would other nations choose to move to a sustained space presence? Is it for the prestige? Certainly not! They don't operate for prestige but for economic development and advantage. We stand to lose significantly if we fail to press forward in an aggressive manner on all fronts of the space technology domain.

With regard to the usefulness of the Space Station, much has been said by many that it is a useless facility for science. Indeed an NRC sub-committee report, a statement by Presidential Science Advisor Bromley, and numerous pronouncements by noted scientists have proclaimed the Space Station as not adequate to support good science. However, many excellent university and industry scientists who have been conducting research on sounding rockets and aboard Shuttle are developing experiments and hardware which can be used to conduct research aboard the Space Station, research which cannot be done on Earth, research which will provide fundamental answers to scientific questions. Not all science will be viable on the Station. Certainly it will not be a platform for the equivalent of our orbiting observatories. It will not be needed for advanced computer research which can be done on Earth. But where long duration reduced gravity is necessary, this platform will meet our needs. Moreover, it will provide for research which shows promise of producing added value through the early application of results obtained, such as is being done through the CCDS program.

> This nation indicated to the world that it was going to lead in moving space science and technology into the 21st century. In so doing, it indicated to our businesses and industry a long term growth commitment for technology development. Failure to keep that course will ultimately result in the abdication of leadership in yet another area, the loss of economic potential in this field, a further erosion of our trade balance, and ultimately the loss of critically needed tax revenue to support basic societal services. We cannot afford these losses. This would be a self fulfilling economic tragedy upon which we would embark. Let us return to a long range space program plan and stay the course by confirming the Space Station program and by providing strong growth funding from NASA.

Mr. Chairman, I want to enter the remarks of Dr. Askew into the record of the hearing today. Clearly there are scientists with a need for the station, plans for using the station, ideas about good science that can be done there. The impact of cancelling the station will be felt by these scientists in the loss of their promising experiments. It will be felt by the nation in the loss of the advancements in the pragmatic areas of new materials, new medicines and new ways of using space that their work seeks to discover.

STATEMENT OF
THE HONORABLE RON PACKARD (R-CA)
FULL COMMITTEE HEARING
IMPACT OF THE SPACE STATION CANCELLATION
JUNE 4, 1991
2318 RHOB, 9:00 A.M.

I COMMEND THE CHAIRMAN OF THE FULL COMMITTEE, MR. BROWN, FOR CALLING THIS HEARING. IT IS CRUCIAL THAT WE UNDERSTAND WHAT THE TRUE IMPACT WILL BE OF CANCELLING THE SPACE STATION. I AM FEARFUL THAT THE ELIMINATION OF THE US PRESENCE ON THE SPACE STATION WILL HAVE FAR-REACHING AND LONG-LASTING RAMIFICATIONS ON COOPERATIVE RELATIONSHIPS WITH THE INTERNATIONAL COMMUNITY. THIS ACTION WILL ALSO HAVE A PROFOUND IMPACT ON THE FEDERAL GOVERNMENT'S RELATIONSHIP WITH THE PRIVATE SECTOR -- NOT ONLY THE JOBS THAT WILL BE LOST IN THE NEAR-TERM BUT ALSO THE POTENTIAL FOR RESEARCH AND DEVELOPMENT ACTIVITIES.

CANCELLATION OF THE SPACE STATION WILL JEOPARDIZE OUR ENTIRE SPACE FUTURE. WE WILL BE THROWING AWAY WHAT HAS ALREADY BEEN A SIGNIFICANT INVESTMENT BY THIS COUNTRY AS WELL AS RISKING OUR INTERNATIONAL CREDIBILITY AND OUR DOMINANT LEADERSHIP ROLE IN SPACE.

ONCE AGAIN, I THANK THE CHAIRMAN, AND I LOOK FORWARD TO A VERY INFORMATIVE SESSION.

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